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A REPORT

THE THIRD ARMED FORCES TELEVISION CONFERENCE

FORT LEE, VIRGINIA

17 - 19 October 1962

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I. Introduction

The Third Armed Forces Television Conference was sponsored by the Office of the Chief Signal Officer, Department of the Army, and was held at the Quartermaster School, Fort Lee, Virginia, which acted as host, during the period 17-19 October 1962. An estimated 250 persons from military, civilian and industrial organizations attended. They heard reports, witnessed demonstrations and exchanged views on instructional television. It was an excellent example of cooperation among military, civilian and industrial groups.

The first conference held in 1960 was aimed at summarizing ten years of military television activities. For a period of four days in the Pentagon, representatives from the three services described their facilities and techniques of application. It was also the first organized opportunity to exchange views and delineate the use of instructional television in the Armed Forces. In 1961, the second conference was held as part of the general convention of the National Association of Educational Broadcasters. More modest in scope, its four speakers attempted only to summarize new developments in the previous year.

It had been my intention, when organizing the first conference, that in succeeding years other military organizations would take over and continue the conferences. I was gratified, therefore, when the Quartermaster School, Fort Lee, Virginia offered to serve as host for the 1962 meetings. Although the newest among Army facilities, Fort Lee television soon established itself as one of the most active and progressive in the field. Since the conference would be the first encounter with a military television facility for many of the participants, the Fort Lee location seemed ideal.

This impression was confirmed. Under the guidance of its director, Mr. Thomas Dolan, the Television Division presented an impressive and convincing picture of how the training mission of an installation can be improved by the effective use of television. Just prior to the conference, I had visited a number of Army installations who were considering the acquisition of television. I feel sure that their seeing the Fort Lee television facility considerably enhanced their perception of the value of instructional television.

An important aspect of the conference was the demonstration of television equipments by industry. These exhibitions and demonstrations are expensive and I am appreciative of the full scale attendance and efforts made by members of the television industry at the conference. Among the equipments on display were television cameras, large screen projectors and receivers.

In planning the agenda of the conference, the composition of the potential audience as well as the current status of military television were considered. The audience would be dissimilar in background although bound by a common interest in television. There were representatives from installations which had been using television for a decade, while others came from installations which did not possess television or had such facilities for less than a year. From comments received afterwards, I believe our efforts to arrive at an agenda of interest to these disparate groups were successful.

The formal presentations ranged from general descriptions of how television is used for teaching to a technical description of television recording techniques. I found one of the most interesting presentations was that describing the use of television by the Navy in carrier landing. Although of apparent use only to the Navy, one could guess from the appreciative remarks of the audience that the ingenuity shown in this application was stimulating to the thinking of the conference.

Both formally and informally the conference offered many opportunities for the exchange of views and information. The tradition of cooperativeness among educational television personnel was repeatedly mirrored in cafeterias, hallways and other places at Fort Lee, where you would see Army, Navy and Air Force uniformed personnel engaged in conversation with university or industry representatives.

The reports which follow are based on an audio recording made of the conference proceedings. However, some speakers were asked to submit a copy of their presentation to reduce transcription time. A number of excellent presentations made during the conference are not reproduced here. Generally, they were based on film and television recordings to illustrate various points. Without these recordings, the substance of these presentations did not lend themselves to reproduction in this report.

I wish to express my appreciation to General Hugh MacIntosh for serving as host to the conference, to Colonel Robert Taylor, Deputy Commandant, Quartermaster School, Mr. Thomas Dolan, Chief, Television Division, Fort Lee, as well as to the speakers who contributed to the conferences. In 1964, the Fourth Armed Forces Conference will be sponsored by the Air Force and held at Lowry Air Force Base, Denver, Colorado.

JOSEPH H. KANNER
Chief, Audio-Visual Applications Office
Audio-Visual Communications Directorate

THIRD ARMED FORCES TELEVISION CONFERENCE AGENDA

17-19 October 1962

Fort Lee, Virginia

Program

Wednesday, 17 October

0800 - 1300   -   Registration, Tours of Exhibits and Facilities

1315 - 1330   -   Opening Ceremony: Colonel Robert B. Taylor
Deputy Commander, Quartermaster Center
and Fort Lee, and Asst Commandant,
U. S. Army Quartermaster School,
Fort Lee, Virginia

Dr. Joseph H. Kanner
Chief, Audio-Visual Applications Office,
Army Pictorial Division,
Office of the Chief Signal Officer
Washington 25, D. C.

Major John Chase
Chief, Doctrine and School Training Div, G3,
Quartermaster Center and Fort Lee, Va.

Mr. Thomas J. Dolan, Jr.
Chief, Television Division,
U. S. Army Quartermaster School,
Fort Lee, Virginia

1330 - 1350   -   Teaching by Television in the Armed Forces:
Dr. Joseph H. Kanner

1350 - 1410   -   Current Status of Television Teaching in the Armed Forces:
Navy - Mr. Joseph A. Murnin
Instructional Standards & Materiels
Divs, Dept of the Navy, Navy Annex,
Washington, D. C.

1410 - 1430   -   Current Status of Television Teaching in the Armed Forces (cont
Army - Lt Col Hollis Dakin
Chief, Television Branch
Army Pictorial Division
Office of the Chief Signal Officer
Washington 25, D. C.

1430 - 1445   - Coffee Break

1445 - 1505   - Current Status of Television Teaching in the Armed Forces (contd)
                <u>Air Force</u> - Major Thomas Capraro
                                  Television Coordinator,
                                  Hq U. S. Air Force,
                                  Washington, D. C.

1505 - 1535   - TV at Lee: Mr. Thomas J. Dolan, Jr.
                                Chief, Television Division,
                                U. S. Army Quartermaster School
                                Fort Lee, Virginia

1535 - 1545   - Break

1545 - 1610   - Air Force Academy Television:
                                Captain John Haney
                                U. S. Air Force Academy, Colorado

1610 - 1640   - The Navy Pilot, LSO Landing Aid Television System:
                                Commander James Parady
                                Head, Visual Landing Aids Branch,
                                Bureau of Naval Weapons
                                Dept of the Navy
                                Washington, D. C.

1640 - 1700   - Tour of Exhibits

1715 - 1815   - Social Hour

1930 - 2100   - Review of Tapes and Kinescopes (as requested -- optional
                                audience)

Thursday, 18 October

0800 - 0900   - Exhibits

0900 - 0930   - The Chaplain and the Commander, A Study in Television
                Techniques: Lt Col Albert McCleery
                                U. S. Army Pictorial Center, New York

0930 - 1000   - Television at Lowry:
                                Mr. John Manley
                                Training Officer, Television Division,
                                Lowry Air Force Base, Denver, Colorado

1000 - 1015   - Coffee Break

1015 - 1045   - Television at Fort Monmouth:
                                Major Andrew Burt
                                Chief, Television Division
                                U. S. Army Signal School
                                Fort Monmouth, New Jersey

1430 - 1445   - Coffee Break

1445 - 1505   - Current Status of Television Teaching in the Armed Forces (contd)
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1015 - 1045   - Television at Fort Monmouth:
                                     Major Andrew Burt
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                                     U. S. Army Signal School
                                     Fort Monmouth, New Jersey

1045 - 1145   -   Television and Medical Training:
         Mr. Ralph Curtis
         Walter Reed Army Medical Center
         Washington, D. C.

         Mr. Fred Butcher
         Bethesda Naval Hospital
         Bethesda, Maryland

         Dr. Glenn Lembke
         Hq Aerospace Medical Division
         Brooks AFB, Texas

1200 - 1315   -   Lunch
         Dr. Lawrence Frymire
         Chief, Educational Broadcasting Branch,
         Federal Communications Commission
         (Guest Speaker)

1330 - 1400   -   Current Research in Television:
         Dr. George Gropper
         Associate Program Director for
         Training and Education,
         American Institute for Research
         Pittsburgh, Pa.

1400 - 1430   -   Television in Basic Training:
         Lt Wesley Marshall
         Army Pictorial Center, New York

1430 - 1445   -   Coffee Break

1445 - 1515   -   Maxwell Air Force Base:
         Lt Col William S. Curry
         Air University, Maxwell AFB, Alabama

1515 - 1545   -   Television at Fort Gordon:
         Mr. Joseph Jordan
         Television Division
         U. S. Army Southeastern Signal School
         Fort Gordon, Georgia

1545 - 1600   -   Break

1600 - 1650   -   The First Year in Television, Panel
         Chairman - Major Robert Spalding
         Hq Air Training Command
         Randolph AFB, Texas

1800 - 2030   -   Dinner Meeting   Mr. Vernon Bronson
                                      Director of Development and Special Projects,
                                      National Association of Educational
                                      Broadcasters   (Guest Speaker)

Friday, 19 October

0800 - 0900   -   Exhibits

0900 - 0945   -   Image Improvement in Television Recording:
                                      Mr. Joseph Flaherty, Jr.
                                      Columbia Broadcasting System
                                      New York, N. Y.

0945 - 1000   -   Coffee Break

1000 - 1030   -   Television in Missile Training:
                                      Captain Kenneth L. Shave
                                      U. S. Army Ordnance Guided Missile School
                                      Huntsville, Alabama

1030 - 1040   -   Break

1040 - 1140   -   Use of Television in Training and Information Films:
                                      Lt Col Hugh C. Oppenheimer
                                      U. S. Army Pictorial Center, N. Y.

                                      Lt. jg McLaine
                                      U. S. Navy Photographic Center
                                      Washington, D. C.

                                      Major Robert Spalding
                                      Hq Air Training Command
                                      Randolph AFB, Texas

1140 - 1315   -   Lunch

1315 - 1415   -   Submitted Questions, Panel

1415 - 1430   -   Coffee Break

1430 - 1600   -   Questions from the Floor, Panel

<u>Friday, 19 October</u> (contd)

1600 - 1610   - Concluding Remarks:

                                   Colonel Robert B. Taylor
                                   Dr. Joseph H. Kanner
                                   Mr. Thomas J. Dolan, Jr.

DR. KANNER:

Ladies and Gentlemen. On behalf of the Chief Signal Officer,
General Earle F. Cook, and our official host, Major General Hugh
MacIntosh, Commanding General, Fort Lee, I welcome you to the
Third Armed Forces Television Conference. Some of you participated
in the first conference held in the Pentagon, and the second one,
which was part of the 1961 meetings of the National Association of
Educational Broadcasters. I am sure you will share my belief that
this looks like the biggest one to date. I understand that about
250 have registered and that we have an excellent representation
from the three services as well as civilian and industrial agencies.
A great deal of time and effort has been devoted to making the next
few days interesting, informative and profitable for you.

The selection of Fort Lee as the location of this conference
was in my opinion a fortunate one - one which you will share with me
before this conference is over. It is the newest of our Army
television facilities. But within a very short time, it showed a
display of energy and initiative which have made Fort Lee one of
the leading users of television for training. My associates and I
often refer to Fort Lee as a model of television utilization.
At this time, I would like to introduce our host, the Commandant
of the Quartermaster School, Colonel Robert Taylor.

COLONEL TAYLOR:

Thank you, Dr. Kanner.

All of the members of the Quartermaster School are most pleased
to have you ladies and gentlemen here using the facilities that
Dr. Kanner has commented on so nicely. Also, our Commanding General,
Major General MacIntosh, has asked me to welcome you for him. He is
unable to do so personally because he is away from the post this week.
All of us, even people like me, who are essentially viewers, have
seen television grow from a somewhat unreliable source of entertainment
to a new effective educational medium. In the Armed Forces we have
now reached the point of having our third television conference.
I would like to tell you some of the reasons why I am particularly
pleased that it is being held at Fort Lee.

First of all, I have found that people associated with television
are just as stimulating as the television medium. Our own television
staff and the television visitors we have had have given us many new
and valuable ideas. As a result, our use of training aids has been
improved. And we have various methods for involving our students

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effectively in the teaching process. These improvements have resulted from our contacts with television people and our use of the television craft. From my own viewpoint, my conlact with television people has even increased my vocabulary. I now have a very good idea what a speaker means when he says, "Man, that turkey was a real bomb!" I don't know actually how to answer him, but I have given him the picture. So I am glad that you are here so that the overall stimulation connected with television can have more chance to rub off on the Quartermaster School. Our instructors will be able to sit in from time to time and more of our people will benefit more directly. Beyond the center of selfish aspect, I think that holding the Third Annual Armed Forces Television Conference at the Quartermaster School is very appropriate because television is being used here as an integral part of military education. During the two previous conferences, one in the Pentagon, and one jointly with the National Association of Educational Broadcasters, military television was even younger than it is today. For example, at Fort Lee, our present facility did not even exist at the time of the first conference. Now, however, our students are receiving many benefits from the use of our equipment and television has become a completely accepted and extremely valuable training medium to our instructors. I think, therefore, that it is very fitting for this 1962 conference to be held here where television is, you might say, present for duty. We welcome the opportunity which Mr. Dolan will have later today to show you the kinds of programs that we have been doing here. We also welcome the opportunity to show you our facilities. These are important opportunities for us because I am sure that many of you will give us constructive suggestions for going further. And if any of you represent agencies now in the stage as we were not too long ago, we will be more pleased if you can profit by seeing our operations. We are in the business of teaching by television, and that is the major business of this conference. For all of these reasons, I am most pleased that you are here. My staff and I are looking forward to the presentations that have been scheduled and to the question and answer periods. With a large variety of agencies represented here and the interest and experiences which the various individuals have had, I know that constructive ideas will flow most freely and that all of us and the Armed Forces in general will benefit greatly.

Thank you very much.

DR. KANNER:

    Thank you, Col Taylor. Now I would like to introduce Major
John Chase of Her Majesty's Forces. I have know him only a brief
period but have found him to possess rare and interesting ideas
on many subjects. I am pleased therefore to introduce Major (soon
to be Colonel) John Chase.

MAJOR CHASE:

    Thank you very much, Dr. Kanner.

    I think for the benefit of those of you who are wondering what
on earth a member of Her Majesty's Forces is doing here at Fort Lee,
I should explain I am now on an exchange basis, that is to say,
I am now doing the work performed by an American officer, and I am
representing a member of the QM Corps doing what is normally performed
by a British officer in England. At this point I would like to say
that Mrs. Chase and I are having a marvelous time, both of us, and
I have enjoyed every moment here at Fort Lee and the other forts.
The fact of the matter is that part of my duties with G-3 section
involves me in the coordination of all of the television activities
which takes place outside this school. And some of the activities
that have been coordinated have been very highly successful.

    I welcome you to Fort Lee and I am extremely happy to have you here.

DR. KANNER:

    Thank you, Major Chase.

    Tom Dolan, who heads up the television activity, is one of the
hardest workers I know. A large portion of the credit for Fort Lee's
success in using television for training belongs to him. His support
of the conference has been valuable. I am pleased therefore to
introduce Tom Dolan.

MR. DOLAN:

    Thank you very much, Dr. Kanner, Col. Taylor.

    Most of my time up here this time will be spent in administrative
announcements. There are a number of them. But first of all, I would
like to welcome all of you as I will try to do individually as much as
possible, to Fort Lee and the television portion of the Quartermaster
School. On behalf of the staff and myself here at WFL-TV. If you
have any problems or questions, please feel free to look us up and we
will try to do the best we possibly can.

    There is literature in the rear of the auditorium -- left there
by a number of organizations -- the AF Academy, Navy and Army
installations. I would like to encourage you to go up into the

exhibit area and spend as much time as you possibly can in the time
that is allowed you and encourage our commercial people in the fact that
you attend or check through there and see what they have got to offer.
We considered commercial people here today more in the form of consul-
tants because you may feel to ask them what you will.

There is a question box in the rear of the auditorium. So that
on Friday in the question and answer panel, we should like to have as
many questions as you can come up with. There is a pencil and paper.
If you write down your question, put your name or maybe you don't want
to put your name -- just put the question down -- put it in the box
and we will try to provide for some answers on Friday afternoon on
one of the panels -- question and answer panels.

An interesting note -- if some of you have this evening free and
would like to attend a soccer game, we have a very fine soccer team
here on the post and they are playing the German Sports Club of
Richmond down in front of the officer's club. And we know that
if you enjoy this type sport you will find it a very interesting
evening. Starts at 7:30 tonight in Williams Stadium.

Later on, I hope to give you the whole review of television at
Fort Lee. Let me say once again on behalf of the Quartermaster
School and WFL-TV and staff, I bid you welcome. If there is anything
that we can do to make your stay a successful one, please feel free to
call upon us. Thank you.

DR. KANNER:

In 1960, the first Armed Forces television conference was held
in the Pentagon. Its purpose was to bring together military users
of television for training and to describe the ways in which they
were using the medium. Over a four day period, Army, Navy and Air
Force speakers, using films and television recordings, described their
facilities and the ways in which they were used. Afterwards I was
approached by faculty members from the University of Miami and New York
University who had attended. In effect, they said they were amazed
at the range and scope of military television. And although I had
been associated with military television for many years, I experienced
a similar reaction. I guess I hadn't realized how baby had grown.

How fast military television has grown became even more apparent
when I thought back to the first Army television conference I attended
in 1954 at Camp Gordon. Its purpose was to acquaint Army training
people with television for teaching. At that time, the Army's first
study in television, its application to basic training, had just been
completed, and I was invited to discuss its results. Camp Gordon
had been using television for training for about three years.
Together with Fort Monmouth, these were the only two military
television facilities in existence at that time. At Gordon, television
found a strong advocate in its commandant, General Terence Tully.

He very early became convinced that television represented an important and critical adjunct to military training. A favorite story of Lt Colonel, then Captain Gordon Parks, is about the day in early 1951 when he was called to General Tully's office. According to Parks, the conversation went something like this: "Parks, how soon can we get a television studio and equipment?" To which Parks, in a humorous vein, replied: "How about next week, General?" To which Tully answered: "Fine, I'll be over to see it then."

Well, it took more than one week, but since 1951 Fort Gordon has used television successfully and has a long list of original contributions to television teaching, the latest of which will be described during this conference.

In succeeding years television achieved steady growth, so that today in the Army we have about 9 active users and about 5 more which will acquire facilities within the next year. The Navy has 5 active users and the Air Force has 5.

This growth in the use of television in the period since 1954 did not proceed in a smooth easy fashion. There were many problems and there were many handicaps. Some of these problems still exist. Many were solved, I am glad to say. For example, the opinion I encountered quite frequently in the early days was that any teaching value that television had could be attributed to a novelty factor, and that once the novelty of television wore off, learning would suffer drastically. Well, we know now that television is no longer a novelty in the home and in many schools, and that it can do an effective teaching job. We also know, however, that television by itself does not magically enhance instruction and that there is still the need for the intensive effort which is characteristic of all good teaching.

There has been one question about television and student learning which persists to the present day. It is related to the fact that ordinarily students watching television cannot ask questions and receive answers. There have been a number of ways of approaching this problem. One has been the installation of talk back systems between the instructor in the studio and students in the classroom. Technically, these systems pose no problem. But most of those who try it often drop the approach within a short time. It's clumsy. It interrupts the television instructor's presentation so that very often he cannot cover his planned teaching points. While this may occur in the classroom also, somehow, where television is involved, the wastefulness becomes strikingly apparent.

In still another approach, television is only used to present a portion of an hour of instruction so that the instructor in the classroom when he takes over can answer student questioning. An approach which I favor is to sample student questioning after television presentations and use these questions to improve television instruction. Very often

these questions might not have occurred had the television instructor covered the material. Finally, there is the consideration that the ability to ask questions and receive answers may not always be of paramount importance. Wilbur Schramm of Stanford, about a year ago, listed over 300 television studies in which comparisons were made between television and existing conventional instruction. Very often, in conventional instruction, question and answer opportunities were provided. Yet throughout these comparisons there were very little differences in teaching effectiveness between television and conventional instruction.

Another problem which is not always overtly expressed but is undoubtedly in the minds of many is the question of whether television will result in the loss of instructors. I do not know of a single instance where television has resulted in the loss of an instructor's position. And I think there is a very good reason for this. At most military installations, literally thousands of hours of instruction are presented yearly. At Fort Monmouth and Fort Gordon where television has been used for over a decade, only a fraction, perhaps five percent of the total number of hours of instruction are presented by television. There are various reasons for this. The major one is that television should be used only where it offers some teaching or administrative advantage which existing methods do not provide. Television equipment is expensive. Those who use it must carefully select those segments of instruction which would best benefit from the use of television. In these segments where television functions, it may replace not instructors but instructional hours. This frees the instructional staff in many cases from a great deal of repetitive instruction, very often requiring extensive preparation each time it is given live in the classroom. This extra time can be used, for example, to give individual attention to certain students and to better prepare other instruction which is not given on television. But I need I describe in any detail how the extra time of a skilled instructor may be employed? We received dramatic confirmation of this concept of replacement of instructional hours in a study we performed recently in applying television to basic training at Fort Dix which will be described later in the program by Lt Marshall.

One finding was that over an eight week period, for a single basic training company, television eliminated the need for about 150 hours of live instruction. The faculty group which provided this instruction thus had its work load decreased by that many hours and it must have been a welcome relief to this overburdened group.

One of the early findings which stems from our research in the use of television was that it could be used to teach manual skills. In our study in basic training at Fort Gordon in 1953. I believe we were the first to demonstrate this use of television. A basic training company disassembled a light machine gun while watching the television instructor. Since then, this use of television to teach manual skills has increased. For example, radio maintenance skills, certain types of teletype repair, and typing itself, have been taught

by television. Recently, at Fort Dix, we demonstrated that a company could be taught the disassembly of the M-1 rifle this way. This use of television, however, has not been fully explored at many installations, probably because of lack of familiarity with the techniques involved. But as the requirements for producing skilled military repairman increase, I predict television will find an increasing role in teaching of various manual skills.

Until about 1956, when we talked about television instruction we referred mainly to live television. True, it was possible then and it is now to make film recordings of live television instruction. These are called kinescopes, and they continue to perform a valuable service. But it was not until the appearance of video tape recorders which permitted immediate recordings and playback of television instruction that the flexibility and usefulness of television for instruction were increased manyfold.

Prior to this equipment, if you wished your best instructor to teach as many classes as possible by TV, it was necessary to reschedule your classes so that they could all be taught at the same time. Any rescheduling is a headache and very often this requirement could not be met.

The value of video tape has increased with each year. With Video tape, television becomes adaptable to almost every instructional situation. It is no longer necessary to think of major rescheduling problems. The major advantage of video tape lies in its reduction of repetitive live instruction. Where subject matter remains constant and has to be presented a number of times, to various classes, video tape has been very valuable. At present, this is the major use of video tape, to record stable areas of instruction using if possible the best instructor and then teaching as many classes as required this way. But there are many other applications which are beginning to find increased use. One of these is for instructor training. Anyone who has watched a playback of video tape instruction, with the television instructor present, has been impressed with a fairly common experience. This instructor very often says, "My God, is that the way I look and talk? I just didn't realize it. I would like another try at this." This is often followed by striking changes in the instructor's teaching behavior, the disappearance of annoying gestures and improvements in speech delivery. These insights are often achieved much more rapidly than when someone else, without the benefit of video tape playback, criticizes an instructor's performance. It was on the basis of this type of observation that Fort Monmouth and Fort Gordon applied television to their instructor training program as a method of self-criticism and achieving proficiency.

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The similarity of teaching requirements among Army installations and among military installations is generally agreed upon. To take an example, when Ohm's Law is taught, it should be the same at Fort Monmouth, Fort Gordon, Naval Training Center or Lowry Air Force Base. And there are probably thousands of hours of common instruction of this type. Training films have made a modest attempt to cross service lines in teaching some of these common hours. But video tape offers probably the most striking new way of achieving the goal of providing economical, standardized, effective, instruction within and among the three services. But this achievement is still in a primitive stage. We have on occasion exchanged video tapes between Army and Air Force installations. Within the Army, policy on such exchange has only very recently been announced in the new Army Regulation on Television which Col Dakin will talk about later.

During our recent basic training study, we ended up with about 100 hours of video taped instruction. This material can be used by every basic training center within the Army and some of it probably by Navy and Air Force installations. I need not linger upon the savings in money and effort, the potential for standardization of effective instruction, and the administrative advantages which the exchange of video tapes will permit. It will require decisions at a high level and I hope action will be initiated to encourage such exchange not only within the Army but among the three services.

I mentioned the development of video tape equipment as representing a major breakthrough in extending the usefulness of television. I don't know if there are any existing or planned new equipments whose appearance would have a similar effect. But I understand efforts are being made to improve large screen viewing equipment, so that, at least in one instance, from a maintenance viewpoint, and lack of requirement for a completely darkened room, such equipment may find increased use in military television. I personally feel that an important development is represented by the efforts to simplify in terms of maintenance, size and cost, video tape recorders. This would represent an important development because video tape recorders are expensive, running as high as fifty to sixty thousand dollars and close to $100,000 when you include installation, test equipment, and spare parts. I mention this cost also because it relates to a question which keeps coming up in almost every meeting and conference I have attended. In simple terms, the question is very often phrased as, "Why is it that television systems you recommend cost about $200,000 when we know so and so who uses television has only spent $10,000 or $20,000? At this point most of you know what the answer is. If you don't use video tape recorders, if you limit yourself to one or two very simple cameras, if you are using only a handful of television receivers in which one instructor, doing most of the work, may teach one or a few classes, it is not difficult to keep your cost at the 10 to 30 thousand dollar level. But then a pertinent question is, why do you need television under these circum- stances? Before this conference is over, you will have become acquainted

with the Fort Lee television system as well as those of other instal-
lations whose costs run to $200,000 or more. I ask you to judge
for yourself whether the elementary low cost system I described would
begin to do the training job that these systems do. It is simply a
matter of getting what you pay for. Our experience has been, and we have
had some bad experience in this area, if you put in an inadequate tele-
vision system, one which does not permit the user to take advantage of
television, as is the case with the simpler systems, you do two things.
One, you cannot give television a fair chance to meet many of your
training problems. Two, you provide support to those who never liked
television anyway and their dislikes are confirmed by the limitations
of a low cost system.

At various times I have made reference to the teaching effectiveness
of television. I think one of the handicaps in discussing teaching
advantages afforded by television is the very simplicity of many of
these advantages. They are not couched in professional jargon and
do not have an air of mystery about them. For example, an important
advantage afforded by television is that it permits more people to see
what is going on. There are thousands of situations in Armed Forces
teaching involving small parts, in accessible areas, crowded radar
vans where only a few trainees can see what is going on. Television
is superb at solving this problem. I mentioned the role of video tape
in reducing requirements for repetitive instruction. Here again by
placing the best instructor on video tape, those hours of instruction
which don't change very often, and playing these tapes as many times
as you wish you may eliminate many hours of live instruction.

Most of us agree that review is important. It is very difficult
for most people to remember what they have heard or seen the first time,
and we know if they can get a chance to review something, their learning
will generally improve. Video tape permits this type of review in an
economical and comparatively easy manner. In the Fort Dix basic
training study, this principle was applied on an extensive scale. We
placed television receivers in the barracks, and after hours, by means
of video tape recordings, reviewed the previous days or weeks instruction
and also previewed the next days and the next weeks and the next months
instruction. At times when we felt that day time instruction was
inadequate, we used this after hour technique to strengthen weak areas.
No one has a monopoly on improving instruction. No one possesses any
mysterious new approach despite what you may have heard about new ways
of organizing instruction. No one, whether he uses television, live
classroom instruction, or programmed instruction can guarantee that
the first attempt at constructing a teaching segment will be effective.
There is the need to try it out, to give the students a test and then to
modify the instruction where required. Again, no one has a monopoly
on this approach and television instruction can be improved in the same
manner.

But if you don't have the time or the personnel, you can still put
your best instructor in front of the television camera, have him
teach as he might in the classroom with the strong assurance that
his effectiveness will not be reduced.

In the area of military training as in other military activities we are in a competitive situation. Most military instruction is carried out by an instructor in the classroom. This is the major method of instruction and has generally been a good one. It is only when special problems arise, such as shortages of qualified instructors, that additional approaches have been developed. During World War II, training films received their greatest impetus and they still serve a valuable function. In the last decade, television has become established and is now in a period of very rapid growth. Each new proposed way of facilitating military training must compete with these established or existing ways of teaching. They must prove that they can do something which existing methods cannot do.

In conclusion, I feel, based on recent activities with the Army, that this may be the year for the Combat Arms. In 1954, the major television event was the first Army study of the use of television in basic training. This year, another study, on a more extensive basis and pursuing other objectives, was carried out at the basic training center at Fort Dix. We believe that television will soon be used at the Infantry School at Fort Benning, and the Special Warfare Center, Fort Bragg, used in a way which will facilitate their missions as it has those of other schools in the three services. The growth of television in the last decade is indicated by the representation at this meeting which is by far the largest we have had and I feel sure that by Friday, when you have had a chance to see and hear the ways in which the Army, Navy and Air Force are using television in training, you will agree with me that television represents the most important achievement in military training in the past decade.

Our next speaker will describe the current status of the use of television in the Navy for training. He has appeared on our two previous programs -- 1960 and '61, and I consider him to be a most knowledgeable person in this area. I am pleased to introduce Mr. Joseph Murnin.

MR. JOSEPH MURNIN:

In keeping with the them of this conference, that is, the exchange of information among military users of television for teaching, I would like to take this opportunity to explain the approach of the Chief of Naval Personnel in the utilization of instructional television to meet his training requirements, utilization of the medium as the point of discussion, rather than a rote description of the systems, will probably have more meaning for you within the context of this meeting.

It can be initially stated that the Navy approach to television has been an economical one in terms of system complexity and personnel involvement. These two factors have been predicated upon the historical introduction to televised instruction through the Bainbridge experiment in 1957. I am confident that all of you are familiar with the one-camera

television chain where the barest essentials in equipment and personnel were applied to the teaching of Navy recruits on a mass level. The Bainbridge experience has permeated the planning of the Chief of Naval Personnel as new programs are formulated.

We presently have five instructional television systems located on both coasts and the Midwest which are operated and programmed by service personnel. It may surprise you that there are no civilians directly assigned to any of the individual programs under management control of the Chief of Naval Personnel. This statement does not include those programs conducted by the Chief, Bureau of Medicine and Surgery, or the kinescoping projects being directed at the U. S. Naval Photographic Center.

Let us analyze, at this time, one of our mass training programs being conducted at the Recruit Training Command, the United States Naval Training Center, Great Lakes, Illinois. There is a complete professional video equipped studio servicing twenty-six classrooms, capable of supporting approximately twenty-three hundred (2,300) trainees per instructional period. The financial investment is sixty thousand ($60,000.00) dollars. The maintenance and support budget for this fiscal year amounted to twenty-five hundred ($2,500.00) dollars. In terms of system support for an effort of this scope the amount is meager.

During the past year the recruit program completed well over one million (1,000,000) trainee hours of instruction. In this period one day of operation was lost due to system failure caused by a station power problem. Administratively, the staff consists of the following seventeen personnel: (1) five Recruit Command and two Hospital Corpsmen instructors; (2) seven operating and maintenance personnel; (3) a training aids man; (4) an enlisted ajutant, and (5) as a collateral duty an officer in charge. The Navy at the present time does not have primary classification codes for television camera or console operators. There is a Navy Enlisted Classification Code, Number 9791, entitled, "Monochrome Television Equipment Technician." The code has been assigned to the Interior Communication Electrician (IC) rating. To date personnel support has been drawn from the enlisted allowance of the Command. The critieria for selection being based upon possible previous experience with television, aptitude for the task, and interest in the medium. Maintenance personnel have been particularly critical for the recruit program, since the allowance does not contain the Electronic Technician (ET) ratings, who are fully qualified for system maintenance. We have been fortunate in being able to acquire Fire Control Technicians (FT) for maintenance. The negligible amount of system down time attests to the knowledge, motivation, and interest of the maintenance personnel assigned.

The recruit television curriculum consists of some one hundred and five (105) prepared lesson plans, including audio-visual aid material, which are filed for ready availability. The lesson plans encompass all phases of the assigned curriculum from verbal to highly visual and demonstration presentations. It is of interest to note that the extra-curricular Moral Guidance and Leadership lectures normally presented on a classroom-to-classroom, face-to-face level are now presented by means of television

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on a mass trainee level. This application has resulted in measurable savings in time, personnel and disruption to normal class scheduling.

The basic philosophy of the Chief of Naval Personnel underlying utilization of instructional television is that of instructor direction of the presentation, in lieu of a studio floor or console director. The instructor is responsible for the development of the televised lesson plan, as well as, the audio-visual support aids. He works in conjunction with the training aids technician. In the event aids or devices are desired beyond the capability of the training aid technician, assistance can be requested from the local training aids facility. There is no rigid studio discipline imposed upon the instructor during a telecast. For example, should the instructor decide that a particular camera view as seen on his studio monitor is not satisfactory, he will so inform the console operator requesting the desired change of scene or picture framing. Scripts are not permitted; however, the console operator has a run down sheet in order that he can anticipate programming.

The question often arises whether a mass instructional television program, such as the one under discussion, results in the saving of instructors. The question is of secondary importance, most important, in the application of modern teaching methods to training is, of course, improvement in the effectiveness of instruction. However, since the question continually poses itself, let us inspect the recruit training situation and draw our own conclusions. An enlisted company commander is assigned to each recruit company. This man remains with the trainees from the time the company is formed until it is graduated. It is the responsibility of the company commander to supervise the recruits' welfare, discipline and training. In relation to formalized training, the company commander musters his company to the classroom. In the face-to-face instructional method the company is left with the instructor until completion of the lecture, when the company commander regroups the recruits and moves them to their next daily assignment. The company commander acts as the classroom monitor during a television presentation, and should system failure occur he is responsible to complete the lecture face-to-face for that particular session. It requires a minimum of five personnel to present a telecast. Since the company commander should be with his company at all times, it would seem that for any given session to twenty-six classrooms a saving of twenty-one instructor hours are being realized. Suppose we take an extreme example and consider the entire staff of seventeen as part of a telecast, we are still realizing a saving of nine instructor hours. Naturally, we can carry this proposition further ar state that for an eight hour daily schedule, depending upon your statistical preference, that we save either one hundred and sixty-eight (168) or sixty-four (64) instructor hours daily. Providing that we accept the foregoing proposition, does a relationship exist between instructor hours saved and a decrease in the instructor personnel allowance for the command? To answer this question we must recognize that for such a large operation as recruit training, personnel who would otherwise be on the podium teaching are in all probability being utilized for other important duties. Therefore, to date television has not effected the personnel allowance at the Recruit Training Command, Great Lakes, Illinois.

It should be noted at this point, that the instructor ratio for technical instructional television differs from that of the recruit program. Technical instruction by means of television provides a qualified instructor for each classroom. Television is utilized to present the theory portions and the demonstrations or experiments in support of the conceptual information. The classroom instructor supplements the televised presentation by clarifying and answering trainee questions.

An interesting adjunct to the recruit training program is the evening lounges, "entertainment and training", telecasts. Experimentally, the distribution cable was extended from the classroom building studio to a nearby barracks. Six lounges were equipped with television receivers. There are twelve hundred men housed in this building. Two programs are telecast each evening, consisting of a live off-air news and weather broadcast and a motion picture originating from the recruit television studio. The motion pictures might be one of the Victory at Sea series, or how the Seabees build a bridge. Content of the films (training or entertainment) apparently is of little concern in terms of acceptance by the viewers. Based upon questionnaires the recruits unanimously endorse the evening programs. The Command reports a fifty percent drop in disciplinary problems for those companies participating in the evening telecasts, and attributes this to the fact that company permission to attend is based upon daily group behavior. The Command concludes that the recruits maintain intra-company conformity to the rules by disciplining their peers.

It has been requested that seven more barracks be equipped to receive the evening programs. Should this request be approved the potential audience would reach ninety-six hundred (9,600) men. Since all that is required to convert a space into a television classroom are television receivers, this project would add an additional forty-eight television classrooms to the program which could be used by the Command as required. We do not want to lose sight of the training value of the evening program for certainly some learning would be expected to occur.

The final item of interest relative to the recruit television program is the capability of the brig to monitor the training programs. In this application selected telecasts are presented to the occupants of the brig as part of their rehabilitation. The program has not been in operation for any length of time, so we do not have utilization or effectiveness data to report. It is anticipated; however, that the proper selection of televised information originating from the recruit television studio will provide an important contribution toward the rehabilitation of these men. Utilization of television for this purpose can be carried a step further with programs specifically oriented to meet the requirements of the rehabilitation program.

This then concludes the discussion of the mass instructional televis ion program conducted at the Recruit Training Command, the United States Naval Training Center, Great Lakes, Illinois. Let us continue with a few words concerning other programs presently being augmented or planned for the future.

Available qualified television maintenance personnel has been one of the major problems which in the past affected many of the programs. The Chief of Naval Personnel to relieve the situation designated television maintenance responsibility to the Interior Communication Electrician, and authorized the establishment of a course of instruction in maintenance at the IC "C" School, the Service School Command, the United States Naval Training Center, Great Lakes, Illinois. Originally it was scheduled to be a fifteen week course, but with the requirement for maintenance of the Pilot Landing Aid Television (PLAT) system, the course will be nineteen weeks in length. The curriculum will include maintenance training in all areas of monochrome television equipment from television receivers to quadroplex head videotape recorders. The first class is tentatively scheduled to commence training early in the spring or summer of 1963. The graduates from this school will be assigned to meet the television maintenance requirements for both the shore based and Fleet installations.

The Chief of Naval Personnel is investigating the feasibility of using military assigned frequencies as a means of broadcasting instructional information from shore based studios to ships at anchorage. We must go to the military spectrum, since open air broadcast frequencies in either the VHF or UHF areas for use by the military services within the continental limits of the United States are difficult to obtain in terms of the licensing policies of the Federal Communications Commission. Therefore, the Chief, Bureau of Ships at the request of the Chief of Naval Operations is conducting the technical investigation to determine whether the concept is feasible, as well as practical. Should the findings of the Chief, Bureau of Ships prove favorable monetary and personnel time savings are expected to accrue in terms of the fleet training program. Fleet training is conducted either aboard ship as on the job training, or at the shore based schools managed by the Fleet or the Bureau of Naval Personnel. Considering the shore based facilities, a ship must send a man to the school which results in his loss to the ship for duty and incurs the cost of his transportation and upkeep.

In all probability should the shore to ship concept be initiated, San Diego, California will be the site for the first installation. In this application the Recruit Training Command television facility, located at the United States Naval Training Center, would provide the originating equipment. The system will generally consist of a microwave link four miles to Point Loma, the highest geographical point in the area, to a transmitter where the signals weill be beamed to the anchorage sites. It is envisioned that the instructional information will be placed on tape and maintained as an videotape library. All broadcast information will be of an unclassified security nature. Since the purpose of the program will be to serve the Fleet, the training requirements of the Type Commanders will be met. The instructional agenda will include, for example, many of the Navy training curricula, both specialized and general, as well as, advancement in rating, language, science, and leadership. The technical feasibility investigation to be conducted by the Chief, Bureau of Ships has been budgeted for fiscal year 1964.

A proposal has been submitted by the United States Submarine
Training Facility, Pearl Harbor, Hawaii to the Chief of Naval Personnel
for a dockside closed-circuit television distribution system. Twenty-one
(21) submarine slips are involved with the originating studio adjacent
to the docking area. The proposal has been tentatively approved contingent
upon a requirement analysis at the site. This project would be the first
dockside system which is logistically practical. Generally, the docking
areas are distributed over such divergent areas of a Shipyard that the
cable runs involved are extremely expensive.

The curriculum will include training for on-board submarine watch
personnel in School of the Boat subjects requested by the Submarine Commanders
and the Commander Submarine Force, Pacific Fleet.

The first television workshop conducted by the Chief of Naval
Personnel is planned for the Spring of 1963. The proposed location will be
the Recruit Training Command, the United States Naval Training Center,
Great Lakes, Illinois. Representatives will attend from the programs
presently in operation and also from facilities where future programs
are planned. Interested Fleet personnel will be invited, as well as,
the other Bureaus and Offices of the Navy Department. It is hoped that
the Department of the Army and the Air Force will have representation,
not only to observe the Navy method of applying the medium of television
as an aid to training, but more important to compare mutual problems
and interests with us.

In conclusion, instructional television represented by the Chief
of Naval Personnel has certainly advanced in a positive vertical direction
from the original one-camera television chain concept, and in the future
will play an increasingly important role as ways are sought to meet the
training requirements of the Navy.

DR. KANNER:

Our next speaker will describe the current status of television
for teaching and other purposes in the Army. He has been involved
in Army television since 1956. In 1956 and 1959 he was Chief of the
Television Division at the Army Pictorial Center, and since 1959,
despite what the program says, has been Chief of the Television Branch,
Army Pictorial Division, Office of the Chief Signal Officer. I am
pleased to introduce Lt Col Hollis Dakin.

COLONEL DAKIN:

Colonel Taylor, Ladies, and Gentlemen.

There is no dramatic announcement for me to make. There is no new or special technique for me to describe to you. There aren't any new statistics for me to amaze you with.

I have a plain, sober report. It consists of three parts. One is on over-all television applications in the Army, and the other two cover major provisions of our regulations pertaining to television equipment and activities. There may be some here who would question the appropriateness of my subject matter. I submit, however, that the purposes of these conferences are to share and to benefit -- share our aims, practices, experiences, accomplishments, concerns, -- yes, even our failures -- with the hope of benefiting from the experience of others -- taking home with us new ideas to help us improve our operations or, perhaps, to avoid pitfalls already suffered by others.

So far as I know, it is for convenience's sake more than any other that we have usually categorized the Army's applications of television into four types -- instructional, informational, technical, and tactical. I shan't dwell on these long for last year I detailed them rather completely.

The emphasis in this conference is on the first of these categories -- instructional television, and there will be other speakers who will discuss various aspects of it. Therefore, suffice it for me to say that nine of the Army schools have television installations. We haven't had a new one added for nearly three years, but recent increased interest in television for instructional purposes in the Army presages at least two new installations before long.

We have usually thought of the informational use of television as referring to its use for disseminating public information. In that sense, the last year has brought little change in informational television, too. The Army used to operate 13 of the overseas television stations, but one of them has been discontinued.

At this point I should mention that I feel we have tended too much to put entire installations into one of the applications categories or another, whereas actually many facilities are used in more than one. An example: A school's system obviously is primarily intended as an instructional system. The use of such a system, however, to provide daily news programs, or to record newsworthy coverage for release on a local commercial television station, puts it into the informational category as well.

The informational category of television application, then, applies in part, at least, to more than just the Armed Forces Radio and Television Stations overseas.

Technical television, as a category, covers many types of separate purposes. Just a couple of examples:

Television has been used as a remote viewing device in places impossible or too dangerous for human eyes to be. The facilities which have been put in at Dugway Proving Grounds in Utah are our most recent sizeable installation of this type.

Another example is the development of a television system into a special device to track missiles.

Now we come to tactical television. Although I know of no official definition for this term, we think of the category as including:

Television for briefing purposes :: the tactical situation.

Television for seeing when it's too dark for the naked eye to be depended upon.

Television for surveillance (other than just when it's dark).

Television for sighting or range finding.

We are still quite a long way from the practical use of television in this category. The past year has seen some interesting developments in the area, but we have still got a long way to go before the developments result in wide scale acceptance of television in the tactical environment.

Let me now turn to the Army Regulations which are of concern to almost all users of television equipment in the Army -- excepting specifically the home type television receivers intended for the usual broadcast reception and the use of television equipment in some R&D activities.

The regulations are:

AR 108-40   Pictorial -- Television, and

AR 105-22   Communications -- Planning and Development
             Projects for Strategic Non-Tactical Communications-
             Electronics.

Obviously, of the two, we are more concerned with the former because it deals with our medium in detail. But don't toss the second aside in your mind, for most of the television facilities in the Army have been authorized under the provisions of the latter. More of this in a few moments.

The current version of AR 108-40 is dated 31 July 1962. The timing of its publication was unfortunate, as I am sure the Army people here are well aware. For those of you who don't understand, let me explain. The original, and only previous, edition of the regulation was dated in 1956. Two things primarily demanded its updating:

(1) Many of the references in it had been discontinued or revised and updated, and

(2) The section on television recording needed revision and expansion because of the advent of the magnetic tape recording method.

Now, the publishing of a new or revised AR is not something that happens easily and quickly -- at least in my experience. To make a long story short, the reorganization of the Army under DOD Project 80 caught us with a new version of our prime regulation written with responsibilities assigned according to pre-reorganization days. We knew that if we were to hold up publishing the new AR until we settled down under the reorganization, it would be months before we could get up-to-date references and new recording policies out into the field. Therefore, it was with full realization on our part that we went ahead with publication. It means that this new AR needs to be interpreted in accordance with the new organization -- just like all other ARs -- until another new version is published. And we are already at work on the new rewrite.

It is the recording policy that I want to talk about in some little detail.

Regulations, I have found, at least, are frequently much easier to make sense out of if I have a little background on them or if I can get an appreciation for the general basis of their detailed provisions. Let me explain a bit, therefore, what is behind the provisions of the recording section of AR 108-40.

First, television recordings share with motion pictures the ability to recreate visual information -- with or without an audio accompaniment. Indeed, good kines are difficult to distinguish from actual motion picture work.

Under considerable pressure brought to bear from an Assistant Secretary of the Army level, the motion picture AR -- AR 108-6 -- was revised to strengthen its provision for the authorization and approval of films in the Army. We felt that it was a necessary corollary that television recording provisions in AR 108-40 be rewritten.

So what we have provided, in essence, is this: An organization
which has duly authorized television equipment may make recordings
at its own installation for its own use at that installation.
However, any use of its equipment to make recordings outside its
installation, for any other organization, or for use outside its
installation, requires approval of the Department of the Army.
The only exceptions to this are the public information recordings
which I mentioned previously in another context, and briefings
prepared for use at one remote location.

In forming these provisions we feel we have provided for two
desirable conditions:

(1) Permitting wide use of facilities at the local
installation for which they were authorized.

(2) Requiring Department of the Army approval for recording
material which is to be circulated, so that distributed materials
will contain approved policy and doctrine, and will be of suitable
technical quality.

AR 105-22 is the regulation, as I have said, which provides
authorization of television equipment as fixed plant communications
facilities. We call them Class IV projects and in that sense they
are similar to post telephone exchanges and fixed radio stations.
Those of you here who come from installations which have facilities
authorized this way are probably only too aware of AR 105-22;
I trust you will bear with us while I address myself to the others, then.
My purpose in discussing it for a few moments is three-fold.

(1) There are some Army people here who are contemplating
new television facilities, and I feel what I have to say will help
them over some of the administrative hurdles they have before them.

(2) The Navy and Air Force people present -- at least those
from the departmental level -- may be interested from the controlling end.

(3) The commercial people present may be helped to understand
our channels of administration in this area, so that they know better
how to get information about their products and services into proper
channels for effective consideration.

The best way to explain the process I want to describe, I feel,
is to use an example. A hypothetical one will serve.

Let's consider the case of good old Fort X. At Fort X the main
activity is instruction, since Fort X is the home of the School Y.

Now, television's use as an instructional tool is no longer new in these United States, and the folks who run school Y have often read about educational television activities, both in-service and in civil education. Occasionally they have considered having some television facilities of their own, and finally these considerations have got serious enough so they have asked for Department of the Army assistance.

Such inquiries wind up on Dr. Kanner's desk. So Dr. Kanner, making up the educational half of the team, and a technical man visit school Y to consider its curriculum in order to determine if there are enough courses in which television can be used as an instructional aid to make it worthwhile to invest the very considerable amount of funds and personnel which such a facility represents. The technical member of the team can then make preliminary recommendations for quantities and types of equipment and personnel.

To explain the background upon which these recommendations are based: The "technical man" to whom I just referred has ordinarily been Mr. Blair or someone else from our Television Branch, or an engineering man from the Television Division, Army Pictorial Center. We don't profess to be oracles in the specialized field of television equipment and techniques. But a great deal of directed effort is spent, both in our Branch and in the Television Division at the Army Pictorial Center, to keep abreast of developments. The Army Pictorial Center has included in its statement of missions and functions, the responsibility to -- and I quote in part -- "performs ....testing on.......new equipment being considered for use and procurement, in order to evaluate design, construction and operational qualities" and again "disseminates pertinent test information and results in order to guide personnel in engineering, procurement, and operations of television components and facilities."

Having made recommendations based on this kind of background, then, at this juncture it is up to the post Signal officer at Fort X to prepare a request for a Class IV project. In it are indicated such information as:

(1) Purpose and justification for the facility.

(2) Estimated costs.

(3) Availability of funds for procurement and operation.

(4) Sources of personnel for operation and maintenance.

(5) Bill of materials.

The request is forwarded through command channels to the Office of the Chief Signal Officer (OCSigO, we call it). Like all other requests for fixed plant communications equipment this one arrives in the Command and Control Systems Division; but because it deals with

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television, it is sent to Television Branch of the Army Pictorial Division (which is also part of OCSigO) for comment and recommendation. You may remember from my introduction that I am chief of that Television Branch, so now I can say we. We and Dr. Kanner (who works with us but is not actually assigned to our branc h) review the application to see that it conforms to the recommendations that were made during the visit to school Y. Assuming we go along with it, we return it to the Command and Control Systems Division. They, in turn, send it to the Communications Systems Directorate of the U. S. Army Strategic Communications Command. Here it is completely engineered, and detailed specifications are written. Again, we check, in our branch, and the project is ready for contract. The post Signal officer at Fort X may contract it, or the Communications Systems Directorate may do so.

The question is quite frequently asked: "Why don't we have a standard television studio package so all a school has to do is to request one?" The answer is not simple, but it goes like this.

To standardize on a package means a cut off at some stage in the development in the state of the television art and the availability of the equipment. The speed of these has been so rapid and quantities needed have at the same time been so small, that we felt standardization was unwarranted. Keeping the door open means that each requirement can receive consideration against any reasonably available types of equipment, taking advantage of any recent developments which have been well tried and found to warrant procurement.

I should mention at this point that there are available at the Army Pictorial Center complete mobile television facilities which are used, among other purposes, for giving demonstrations at schools and other installations. In other words, arrangements can be made for the use of temporary facilities, so that an organization which is considering television facilities can try out equipment and applications before making a final decision on whether to request such facilities. Requests for the use of such mobile facilities should be sent through command channels to the Office of the Chief Signal Officer, Department of the Army.

One parting thought against all this talk of regulations, administration, authorities, equipment, and so on.

A television facility produces results through both its equipment and personnel. Obviously, neither of these can do anything without the other. But both can exist and the results can be nothing -- zero in quantity or near zero in quality. Given adequate equipment and adequate personnel, there remains one essential, although intangible element which is all-important. That is attitude. There is no longer any doubt that television can be a very effective instructional tool. Like other tools, however, its effectiveness can be realized only if it is properly used. Its purpose must be worthy. The people who

operate it must be capable; but more than this, they must have the drive
which makes a good, competent, operating team. But there is still more.
Even this far, we still have only a potential. Without the support of a
command and the staff elements properly involved in its operation,
a television facility just can't begin to realize its potential.
Where that support is given, on the other hand, television can come
up to its expectations. Where enthusiasm and capabilities are given
the opportunity and resources to flourish, it is amazing what ingenuity,
efficiency and effectiveness result.

The people here at Fort Lee have been the best example of this
kind of success that we have had in the Army. From their dedication
day on 26 January 1960, they fairly leaped into activity. Within
only a few months they had so successfully demonstrated to the faculty
and staff here at the Quartermaster School how effective television
can be that (even though they were working from a studio which had been
remodeled from a laundromat) they needed expansion to keep up with
the demands for their services.

Then came this new building. Provisions were made for much more
adequate facilities for television, because by this time television
had solidly proved itself here.

Not in any sense of the word to detract from the resourcefulness,
energy, initiative, ability, and just plain hard work Mr. Dolan and his
whole television crew here have put into making these facilities an asset
to the School, I am sure you will find that they will all agree with
me that they have been able to make such a valuable contribution to
the instruction here because of the consistent and dynamic support
they have had from their superiors. This is a most important element
if an instructional television facility is to be really effective.

It's too early in the conference for me to use the closing
"Are there any questions?" because I feel that many questions you may
have now will be answered in the course of the presentations to come.
At any rate, the agenda calls for a panel meeting later, during which
you will have an opportunity to ask the questions you may still have
at that time.

So -- Thank you.

DR. KANNER:

Our next speaker will complete the picture -- the overall description of the ways in which the three services are using television for training. Prior to his present assignment as television coordinator, Hqs, U. S. Air Force, in Washington, Tom Capraro was involved for many years as the television training activity at Maxwell AFB. Here to give a description of the ways in which television is being used in the Air Force, is Major Thomas Capraro.

MAJOR CAPRARO:

Air Force uses of television fall into four general categories:

1. Training and Education - The objectives here are familiar to all of us: Improve the quality of learning experiences - sustain interest - improve retention - reduce the average in-training time. And, with the use of video-tapes or kinescopes, provide audio-visual records of courses of instruction which serve to solve problems in training administration and to upgrade instructional skills.

2. Management TV is a current emphasis within the Air Force. The management of people, money, materiel and weapon systems depends on good command information. TV is used to facilitate the flow of information accurately and quickly into and out of decision-making focal points.

3. Surveillance - TV is used to observe and coordinate a wide variety of operations such as range activities, runways. space chamber experiments and simulators for pilot and navigator training.

4. Special - Actually, this category is corollary to technical. Here we have a miscellany of uses which draw on the distribution system of TV - air traffic control and weather vision are examples.

I wish to address myself to the first two: Educational TV and Management TV in outlining briefly uses within major air commands.

ETV: ATC

The ATC is concerned with skills training. And with a missiles technology demanding men possessing hard core skills, the ATC is confronted with the task of not only more men to be trained, but much more that must be learned and much of that which must be learned and much of that which must be learned is more complex and difficult to learn than before. In short, the ATC is looking for a breakthrough in training

techniques -- a way or ways of providing more training in less time -- not only expansion but also improvement of training. In these respects, the principal value of the TV medium lies in its promise for upgrading the quality of instruction at the same time that it meets the problem of increasing numbers to be taught.

The TV System at Lowry AFB, Colorado, in operation since 1958, has been expanded recently to a three-studio complex with distribution to 52 classrooms. About 1000 students receive the entire lecture-demonstration portion of a basic electronics course by television. A more detailed run-down on the Lowry installation and application will be given by Mr. Manley.

One more thing about Lowry: There is a feeling, a notion that television leads to passive viewing and listening. However, at Lowry, skillful development of methods and materials adapted to TV have led to the opposite result. In other words, the students get into the act during a television lesson.

The closed circuit TV system at Sheppard AFB, Texas, in operation since January of this year, is used to support missile equipment training. Sheppard plans for a mobile unit which can be used to aid instruction on the complex missile trainers located at points remote from the classroom and laboratories.

A third ATC Center using television is Keesler AFB in Mississippi. Keesler's system has been programming for almost a year. 750 students a week receive televised lecture-demonstrations on electronics principles. A complete description of the Keesler application with particular emphasis on kinescoping activities is scheduled for Friday morning.

Future installations are programmed for:

Chanute AFB, Illinois, for Ballistics Missiles Training
Lackland AFB, Texas, for Basic Military Training
Amarillo AFB, Texas, for Aircraft Systems and Supply Training

I might add that the ATC is considering plans for instructor training by television and is exploring programmed learning applications in conjunction with television. Now that has promise. If only we can find a way to combine the economy inherent in TV's mass distribution system with the effectiveness of the teaching machine's focus on individual student performance.

ETV: AIR UNIVERSITY

The Air University, Maxwell AFB, Alabama, has as a major objective the professional education of company and field grade officers. The War College, Air Command and Staff College and the Squadron Officers School offer curricula emphasizing international relations, war gaming exercises, planning, programming, etc. A basic instructional technique involves the placement of student seminar groups in problem solving situations. Within this environment, the Air University TV Center, a two-studio complex with distribution to over 180 receivers, provides an excellent means to improve and control seminar programs and enhance instruction in these general service schools. Col Curry, Chief of the Air University TV Center, will discuss these TV applications Thursday afternoon.

The Academic Instructor Course and Allied Officers School is also tied in with the Air University TV complex. In addition, AIC has a TV studio or laboratory directed to the key problem of training television instructors. After beginning cautiously with a ten-hour course three years ago, the TV laboratory now provides 50 hours of training in studio presentation techniques. This growth reflects a real training need in educational television. Since teachers tend to teach the way they have been taught, the shift from the intimate personal environment of the conventional classroom to the isolation of the TV studio requires special training for TV does not automatically bring about better instruction. Rather, experiences - understandings of basic studio techniques help to give depth and vitality to televised presentations. One of the concepts stressed in the TV lab - however the complexity and cost of the installed system, TV can become an effective tool only through constructive partnership between the instructor on camera and the TV staff. I'd like to point out that Col Wood, Educational TV Director of AIC, will make a presentation on Teaching Teachers TV Teaching Techniques at the NAEB next Tuesday.

ETV: AF Academy

The approach at the Air Force Academy is a carefully considered attempt to exploit the audio-visual resources of television while bypassing the requirements for special space, facilities, expensive equipment and a technical staff. In this TV system, the instructor runs the whole show -- he's audio man, floorman, projectionist, switcher, and director. He presents a complete telecast with a minimum of additional help. Over 700 cadets are receiving TV instruction -- the distribution system links 10 classrooms to the small studio. Capt John Haney, Chief of the TV Division at the AF Academy, will explain his TV-In-The-Hands-Of-The-Teacher concept Friday afternoon.

MANAGEMENT TV: AFSC

Quick reaction or, better still, real time communications -- the display of events as they occur -- is mandatory for the AFSC which has 13 working divisions and centers scattered throughout the U. S. Weapons systems come under one management control, from initial development to delivery to operational commands. This is why the unique capabilities of television along with other techniques is being tapped to improve communications in today's management environment.

The Systems Command first management TV system was installed at its headquarters at Andrews AFB -- programming began last March. The color TV installation at Space Systems Division at Los Angeles will be completed by next month. And the color TV system at Patrick AFB has an operational date of January 63. Planned for the near future will be CCTV installations at:

Ballistics Systems Division, Norton AFB
Aeronautical Systems Division, Wright-Patterson AFB
Electronics Systems Division, Hanscom Field, Massachusetts
Flight Test Center, Edwards AFB
Air Proving Ground Center, Eglin AFB

Brooks AFB, absorbed last year by AFSC, has been concerned largely with the educational uses of TV as Dr. Lembke from the Aerospace Medical Division will explain in detail.

The Systems Command program for television has two phases. The first -- establishing closed circuit facilities throughout the command. In this phase, operational procedures will be worked out and briefings on videotape will be sent to Hq AFSC -- and distributed among the centers. The second phase, which hinges on an approved method of telecasting classified information, will link all field centers with Headquarters. In this way, information can be distributed quickly and accurately to help in the solution of critical management problems.

MANAGEMENT TV: SAC

Programming over the color closed circuit system at SAC Headquarters, Nebraska, began four years ago. Distribution to 30 display points is for key personnel. Two daily briefings are given to General Power and his staff on the routine operations of the Strategic Air Command. Information such as world-wide weather, and the entire status of the huge SAC structure are televised for simultaneous viewing by all senior and supporting battle staff members. A talk-back system is used for asking questions of the briefing officers.

MANAGEMENT TV: HQ USAF

The primary aim of the color CCTV system at Hq USAF is to aid in internal communications. This system, now being installed by the Air Force's Ground Electronics Engineering Installations Agency (GEEIA), will be operational in January.

In order to transmit classified programs, distribution will be restricted to a cluster of 11 secure conference rooms. The system is designed so that at one time a live, taped, filmed or commercial off-air program can be seen by different audiences. A talk-back system ties in all conference rooms with the studio.

The ability to place repetitive briefings on video tape gives the Air Staff many advantages. Briefing officers who now spend a lot of time making repeat presentations can put the briefing on tape which will then be available for playback, on demand, for key officers as their schedules permit. Then again, this tape technique allows for continuous orientation of other Air Staff personnel. We plan to establish a tape network so that briefings on tape - or tape to film transfers can be sent quickly and securely to major commands in order to meet the constant requirement for command information.

Our Phase II or expanded distribution phase depends on a means of telecasting classified programs. With this in mind, we are examining current techniques. One such technique is scheduled for testing next month.

In this particular demonstration, the TV signals originating at Hq AFSC-TV are passed through a black box which converts the analog signal to a digitalized signal which is microwaved to Silver Hill and then on to the Pentagon where another black box in the Hq USAF-TV studio re-converts the signal back to its original form prior to display over the TV receiver. The purpose of this test is to observe real time transmission of a digitalized signal over a standard video link. If visually acceptable, such a signal can lend itself to encryption.

This brief survey highlights the fact that CCTV has been developing in the Air Force with a minimum of central planning and a maximum of local initiative. But, despite the promise of individual applications, the ultimate promise of television can be realized only from an over-all approach. If TV is to be used responsibly and creatively, we've got to link its various elements in a planned program of growth. Some of these elements are:

TV Teaching and Briefing Techniques
Production
Engineering
Graphic Arts

I feel that dovetailing of these elements can occur best by
by organized effort -- a pooling and exchange of operational procedures,
data, and ideas. Further, such an exchange should involve all three
services. The problems of geography and time confronting tri-service
committees not withstanding, we should explore the feasibility of
establishing research or working committees on common problems and
areas of interest. For example, video tapes. How can we assure inter-
changeability of videotapes for a tape network? What information
should be placed on tape leaders? (The work done in this area by Air
Force Systems Command is available in a handout) What shipping,control
and storage procedures should be established for a tape network?
Some of these problems could be assigned to a videotape committee,
so-called, which would work on or select SMPTE and ASA recommendations
to give us guidance in solving the problem of interchangability.
A committee on TV visuals, one on training TV personnel and a committee
to report on current and pertinent TV research are a few more examples.
Depending on the nature of the problem, these committees would compile,
research, define, test, prepare recommended procedures and formally
report their findings at the Armed Forces TV Conference next year.

Specifically, I propose this conference take the initiative
in setting-up an Armed Forces TV Planning or Steering Committee.
This committee to be tasked now, with evaluating the merit of such
a proposal and then, if only on a trial basis and to the extent the
committee deems appropriate, survey, select and define several
problems of common interest, appoint the working committees,
establish basic guidelines, and serve as the focal point for the
TV Projects throughout the year.

DR. KANNER:

Thank you, Major Capraro, for a very interesting and informative
presentation. Up to now the speakers have talked about the different
ways television might be used in training. Now for the next 30 minutes
television facilities at Fort Lee wish to demonstrate some of the ways
in which Fort Lee uses television in their training mission.

DR. KANNER:

In view of the fact that Captain Haney's presentation has been deferred to a later date, we thought we would skip the break scheduled on the program and proceed on to the next presentation. I have not seen it but I understand the Navy has developed a very interesting and useful application of television to landing techniques on aircraft carriers. Here to describe this system is the Head of the Visual Landing Aids Branch of Bureau of Naval Weapons, Commander James Parady.

COMMANDER PARADY:

Colonel Taylor, Dr. Kanner (members) (of) the Third Armed Forces Television Conference.

I am Commander Tom Parady of the Visual Landing Aids Branch of the Bureau of Naval Weapons, Navy Department. I will be assisted this afternoon by Mr. Russ Hartz who is also from the Visual Landing Aids Branch of the Bureau of Naval Weapons and Mr. Nick Valdich of the Naval Air Engineering Laboratory, Philadelphia.

The United States Navy uses television for many purposes. However, our talk today will be limited to one specialized shipboard use and is called "Pilot-Landing Signal Officer Landing Aid, Television, or simply PLAT.

First, let us take a brief look at the flight deck of a modern aircraft carrier. The model that you see here shows the flight deck arrangement of USS ENTERPRISE, CVA-65, the world's largest and first nuclear carrier. The total deck area is about four acres. Aircraft are launched from four catapults. Two of these are located in the bow of the ship and two more are located along the port side in the center of the ship. Aircraft are landed on the angled portion of the flight deck. On this model this is the area with the blue, yellow and red markings. During the landing approach, a minimum of ten feet of clearance for the aircraft arresting hook over the ramp is required for safety reasons. Therefore, a landing aircraft will normally not touch down in the blue area, which is 173 feet long. The yellow area contains the four arresting wires and is 120 feet long. The aircraft tail hook must be on the deck in the yellow area and not more than 20 feet from centerline to make a successful landing. Therefore the total area within which the landing must be made is 40 feet in width by 120 feet in length. The surface is moving at thirty - plus knots and is also pitching, rolling, yawing, and heaving. The red area represents the maximum runout of the arresting gear and shows how near the angled deck bow an aircraft may be at the termination of an arrested landing. The entire landing area is 753 feet long and 70 feet wide. From the number one wire to the angled deck bow is 580 feet. In order to touch down within the 40 X 120-foot area previously mentioned, extreme accuracy in alignment and glide slope is necessary. This accuracy must be attained by carrier pilots through visual reference to the ship. Alignment is obtained from a three-foot wide centerline stripe (or at night, a row of centerline lights). Glide slope is obtained from a stabilized Fresnel lens optical

landing system (FLOIS) which is located off the port edge of the landing
area near the angled deck bow. Briefly, this system consists of a
fixed horizontal line of green lights with a gap in the middle in which
a yellow light appears to travel vertically. When a pilot sees the yellow
light aligned with the green bar the aircraft is on the correct glide slope.
If the yellow light is high the aircraft is high, if the yellow light is
low the aircraft is low.

From the foregoing, we believe you will agree that landing a high
performance jet aircraft aboard even the largest of our carriers is a
precise maneuver. Every aid that we can give the pilot and the landing
signal officer improves precision, and results in better, safer air
operations. It was toward this end that the PLAT system was developed.

A first requirement was to monitor the approach and landing and to
make a recording which could be anlayzed. Also, this recording must be
made from the centerline of the landing area at or near the pilot's eye
touchdown point. This was first accomplished with television techniques
on a trial basis in USS TICONDEROGA, in March 1961. Since that time,
five carriers have been equipped with PLAT, and as a result of considerable
evaluation, the following arrangement of components has been adopted as
optimum. Two image orthicon cameras with cross hairs are located in the
flight deck looking aft through apertures. 1" high and 2" wide. These
monitor adherence to lineup and glide slope and are stabilized to compensate
for ship's motion. One image orthicon camera is located in the island
structure to monitor the aircraft side number and aircraft arresting gear
runout as well as catapult launches and other deck activities. A small
vidicon camera is located in the television control room, scanning a data
board which contains information on the following items:

> Ship identification
> Date
> Time
> Wind over the deck
> Aircraft speed
> Waveoff indication

All cameras have monitors in the control room where the operator selects
the picture to be recorded on tape. The selected picture is transmitted
to monitors located in the ship as follows:

> One at the Landing Signal Officer's platform.
> One in each pilots ready room
> One on the Captain's bridge and
> One in air operations.

The data board information is superimposed on top of the selected
camera view.

At the conclusion of each series of landings the tape is played back
over the ready room monitors so that all pilots can observe their landings
and note any incorrect techniques or dangerous tendencies.

Recording of landings on tape has received high praise from operational commands. It is an invaluable aid for the following purposes:

Improving flight training, in that pilots are able to see their own approaches and landings.

Maintaining flight discipline, in that pilots' performance is reviewed and analyzed by supervisory personnel and

For post accident analysis, in that an accident board can carefully review the tape and determine more exactly what happened.

In this latter regard, a recent accident would have been classified as pilot induced had not video tape shown conclusively that a material failure had occurred. This kind of service has made the PLAT system equally popular with pilots as with those responsible for their training.

The Navy plans to complete equipping all attack carriers with PLAT in the near future. At a later date it is hoped to extend this facility to support carriers and to a number of shore training fields.

Now, with an idea of what PLAT is and what it can do, we will show you a 16mm movie which will illustrate the use of PLAT in USS FORRESTAL (CVA-59). The pictures were taken just after the system was installed, in June 1962. The film contains a brief introduction by CDR Bob Jackson of the Bureau of Naval Weapons, then a reproduction from tape of air operations. These include a number of catapult launches which illustrates the versatility of the island camera and then a number of landings, some of them arrested and some of them touch and go. The sound you hear, in addition to the narrative, will be the actual radio transmissions which were recorded simultaneously on the tape with the picture.

(MOVIE)

Thank you for your interest and attention. We hope anyone desiring additional information or details about the Navy's PLAT system will contact Mr. Hartz, Mr. Vaidich or myself during the remainder of our stay here at Fort Lee.

DR. KANNER:

An important application of television is in the medical teaching requirements of the Armed Forces. There are systems in use at the Walter Reed Army Medical Center, the Naval Medical School, Washington, D.C., and Brooke Air Force Base, San Antonio, Texas. Our first speaker is Mr. Fred Butcher, Head, TV Section, Audio-Visual Branch, Naval Medical School, National Naval Medical Center.

MR. BUTCHER:

The mission of the Television Project, Naval Medical School, National Naval Medical Center, has not changed since the last report to this meeting. Our activities have continued in the utilization of television in medical and dental education, communications and clinical applications, and in the research of new techniques and devices to improve application of the medium to needs of clinical and educational medicine.

Our staff is composed of six civilians and six military personnel employed in the following categories: Two civilians trained in production techniques; three civilians trained in technical operation and maintenance of television and electronic equipment; one civilian secretary; three enlisted medical corpsmen, one of whom is trained in medical photography; two enlisted dental technicians; one Medical Service Corps officer who is the Television Project Officer. In addition, we are supervised at a policy level by a medical officer who is in charge of all audio visual work for the Naval Medical School. The military personnel come to us without any training in television. They are medical and dental corpsmen and officers well founded in their medical specialties, but who must be trained from the beginning in the techniques of television operation. Generally the jobs assigned to the enlisted personnel are camera operation, audio board operation, floor management staging and lighting. Our success has been varied, but for the most part has been good, especially with regard to medical photographers. We are able to keep most of our enlisted personnel between one and one and a half years. In some cases we have been able to get academic training for these people, but most of their instruction takes place on the job.

Our activities are closely coordinated with the Intermedical Television Network, a microwave and cable network tying together six major governmental medical installations in the greater Washington area. This group includes three major production points and three outlying reception points. The production centers are the National Naval Medical Center, the National Institutes of Health, Walter Reed Army Medical Center, and the reception points are Air Force Base Hospital, Fort George Meade Base Hospital, and Fort Belvoir Base Hospital. For this group approximately six hours of programming are scheduled each day during academic seasons of the year. This includes live pickups, videotape program repeats, special tape recorded programs, and training films. These programs can originate live from any one of the major production centers or by film and videotape from either the National Naval Medical Center or Walter Reed Army Medical Center.

The majority of the programs originated by the Television Project for network presentation are lectures regularly scheduled for groups gathered at the Naval Medical School. These lectures are given a broader audience base by eaves-drop coverage with television cameras in the lecture hall and distribution over the Intermedical Television Network. Most of these presentations are video tape recorded for repeat distribution at a later date, further increasing the base of the audience. In some instances where clinical material and patients have been presented and discussed the video tape recording has proven valuable in reviewing the plans for treatment for the patients involved. The studio, with its controlled conditions, is used to produce the more structured presentations which are presented directly to assembled classes and the network or are video tape recorded for delayed presentation.

Not all presentations and lectures are distributed over the intermedical network. The largest number of presentations are what can be called direct classroom support, where a small automatic industrial vidicon camera is taken to the classroom and is used for direct instructor support as a magnifier. This technique has been particularly valuable in the teaching of dental techniques and in the laboratory.

The television camera is used in other areas not concerned with communication and teaching. These include observation such as the control of traffic in the blood letting room of the Blood Bank with an automatic industrial camera mounted high in a corner with a wide angle lens feeding a monitor on the nurse's desk in the reception room; the observation of large numbers of people confined in a small space for a period of time; and the observing of procedures in radioactivity dangerous areas. The camera has also been used clinically to read out the image intensifier of the X-Ray machines; to read radioisotope photoscans under specially controlled conditions; to read slides in microscope study, etc.

The project is very interested in the experimental development of equipment and techniques which will help improve the utilization of television as a service to medicine and dentistry. In the past we have worked with the miniaturization of cameras, the development of fiber optics as a television tool, X-Ray image intensification read out with television, video tape recording, and special camera mountings and lensing especially designed to solve the problems posed by the medical field. The most recent development with which we have been concerned is the adaptation of the miniature transistorized Vidicon camera to the surgical microscope so that for the first time the student surgeon may routinely observe the technique of middle ear surgery without disrupting the operating surgeon.

Each year for the past four years the Television Project has conducted a workshop in medical-dental television in an effort to acquaint the novice with the workings of the television medicine as it is applied to the field of medicine and dentistry. It has been our hope that the interchange of ideas which has taken place at these meetings has increased

the interest of the educators who use the medium and has improved the techniques employed by those people when applying television to the solution of their problems.

As in many other activities, Navy medicine has many communication and training problems scattered over the wide expanses of the world. It would be nice to have all the installations and establishments connected on some kind of super cable and microwave network; however, this is not possible. Nor is it possible to reach many of these places with Video tape. Therefore, we must rely on Television-Film recording to carry our messages for us. Over the past few years we have used the services of the Naval Photographic Center in producing a number of training "Kinescopes" in Nursing, Dentistry, Optics, and medicine. Consistent quality of product has been a problem, but the diligence of the staff at N.P.C. has produced some rather notable results recently and has made it possible to add some very valuable recordings to our libraries.

At this time I should like to present some representative clips from some of our most recent productions:

1. Middle ear surgery - a film transfer from the first Video tape recording of a surgical procedure in the middle ear.

2. Surveying for Path of Insertion for partial Dentures - a direct film recording of a dental laboratory technique.

3. The lensometer - a direct film teaching the technique of operating the lensometer, a device for measuring the power of lenses.

4. The Compound Micromicroscope - a direct film teaching the nomenclature, operation, and maintenance of the compound microscope. Film intended for instructing beginning medical laboratory student in the use of one of their basic tools.

5. Clips of Radio Isotope photoscan readings using television contrast enhancement. A direct film taken from applied usage files.

DR. KANNER:

Thank you, Mr. Butcher. Our next speaker is Dr. Glenn L. Lembke, Chief, Education and Training Division, DCS/Operations, Brooks Air Force Base, Texas.

DR. LEMBKE:

Since there is a limitation of time on the subject of use of television in medical training, I shall limit my remarks to two (2) aspects of television utilization at the USAF School of Aerospace Medicine. I should point out that the USAF School of Aerospace Medicine is one of the operational units of the Aerospace Medical Division of the Air Force Systems Command.

The basic philosophy for our use of television is that the lessons shall be instructor-oriented. We feel that television is a very valuable teaching aid but that it should be used as one of the many audio-visual resources available to the instructor. There are few occasions for our use of television for an entire period. We are not confronted with the situation of mass instruction, such as encountered in many of the teaching situations previously described by speakers on this program. We do have the problem of some large classes where it is difficult for all students to see a particular demonstration or to see a particular piece of equipment that they will be expected to use or will be expected to have some of their staff use. So, the instructor in the classroom is the arbiter as to just how much time will be utilized in the television instruction. We do not use a tight script but do have a shooting script so the cameramen and other operators of the equipment will know what the sequence of events will be. The instructor and the technical crew have a run-through for rehearsal; but at no time do we impose upon the instructor a split-second timing, such as one you would require for a more technically perfect production. The instructor is the director, and he is at liberty at all times to make suggestions to the technical crew to change a camera focus or light concentration so the object being demonstrated is in clear view to the students. This is true whether the instructor is in the studio or is in the classroom. The technical crew hear every word that the instructor is saying to the students in the classroom so they can make any adjustments that might be called for by the instructor. In most instances, the television is used only for a portion of a lesson; that is, the portion where a demonstration or the viewing of a piece of equipment is proper in terms of the objectives of that particular lesson.

Now, let us see the instructor in the classroom. He interjects the demonstration at what he considers to be the psychologically appropriate time in the total lesson. He can do this by two (2) means: First, by using a self-contained unit which is right in the classroom and is on the lecture platform so he can walk over to the equipment, sit at a table and do the demonstration right infront of the students. A second means available to the instructor is having a demonstration come from a studio or laboratory, said demonstration

being performed by one of his colleagues; and this is transmitted to the classroom over a line from TV Central.

The self-contained unit has been a very cheap way of providing an effective use of television. Many of you who are now contemplating the use of television are confronted with the problems of expensive equipment, personnel, and other factors which go into the initial phases of a television installation. I should like to call your attention to the value of a self-contained unit as an initial step in ascertaining some of the uses of television and in giving instructors some experience with the television medium. I recognize immediately that this self-contained unit has extreme limitations and can be used only in very particular types of teaching situations. However, it does have the great value of being available, of being portable, of not tieing-up lines which must be installed or strung into classrooms, and therefore does represent an economy of operation. Specifically, the unit is a vidicon, industrial-type camera placed upon a tripod. At the end of the lens a prism is placed so the object being demonstrated is placed below the prism. The camera has a line direct to viewing monitors in the classroom. The instructor also has a small monitor on the table so he can see the signal that is going out to the class-room monitors. Thus, he is able to see whether the object that he is demonstrating is in the field of the camera and thus is his own director. This is important because the camera is fixed, although it does not have to be; but for our purposes we use the fixed camera on the tripod. This also provides a means whereby the instructor is right in the classroom and questions from the students can be answered immediately without going through the intricacy of two-way audio pickup. We have found that this self-contained unit is extremely valuable in the teaching of forms.

I am sure that many of you have a responsibility for teaching some administrative procedures, and it seems to be a rule in the military to have many forms which must be filled out to complete the administrative processes; This is particularly important in our teaching program because Flight Surgeons, Flight Nurses, Flight Surgeon's assistants, and Air Evacuation personnel are confronted with many forms which must be filled out correctly. We have gone through many stages in trying to arrive at what we feel is the best teaching situation. We have used sample printed forms, slides, flip charts, out-sized models, trans-parencies, etc. Using the forms that have been filled out by the students under the eye of the TV camera gives a reality to the situation which we had never been able to have in any of the other media. The forms have been filled out by the students; and then the instructor selects some, places one under the prism, and starts to correct it. If there are questions as to why a certain correction is made, the students can ask about that right at that moment, and the instructor can give the appropriate reasons and cite the particular Air Force regulation or paragraph in the Air Force manual that governs the situation. Thus, we acquire a magnification of the particular point; you give a sense of movement in that the students see what the instructor crosses out and writes in at the appropriate place; and there also is this sense

of the immediacy of the situation in that a paper of a student sitting
right in the room is being corrected, and that this is a real situation,
not a hypothetical situation. At one time our instructors used to sit
down with each student and make the corrections. This was extremely
time consuming for the staff when we would have a class of 150 or 175
physicians. By using television, all students can see a correction;
and, if this particular correction is made on two or three successive
papers, it is felt then that all of them will have gained from the
experience. If it is an isolated item, then the individual who made
the mistake sees the correction and realizes it. This self-contained
unit has many applications, but time does not permit my giving more
of those.

Now let us consider the instructor in the classroom, or in the
laboratory, or in the studio, and the demonstration being transmitted
to the classroom. In most instances, the regular instructor of the
class is in the classroom; and then, at an appropriate time, he gives
the signal for the demonstration to be brought in from TV Central over
the lines. One of his colleagues is in a laboratory, or in the studio,
and is prepared to give the demonstration. In some instances, the
person giving the demonstration also makes the commentary. In other
instances, the person makes the demonstration as he hears the instructor
making the commentary. In many instances, student questions following
the completed demonstration or even right during the demonstration will
require a repeat of a particular part. The question is asked the
instructor in the classroom and he immediately repeats that over the
two-way communication system, requesting the demonstrator to repeat a
part, or if the camera has not picked-up the point clearly enough, the
instructor can ask the cameraman to come in with a closer view for a
better shot or change the lights so the TV signal will be improved.
Then the demonstrator repeats the demonstration. You will soon see
some clips from three TV demonstrations which originally were transmitted
to the classroom. I might say parenthetically that I often am asked
to brief visitors, and I use closed-circuit television as a means of
bringing certain laboratory situations or teaching situations to the
people who are being briefed. For example, in the clips that you will
see, one of our Flight Nurses will be giving a demonstration. You will
not hear where I asked that nurse to repeat part of it because the
camera had not picked up a particular point as she was explaining it.
This is an illustration of the way we maintain an instructor-oriented
teaching situation.

If you have any questions concerning any points that I have brought
up in this discussion or any questions about our additional use of
closed-circuit television, I would be most happy to answer them during
the informal periods that are still available during this conference.
However, I think it is time now for you to see the video-tape clips
which I have brought with me. The first shows Doctor Billy Welch at
the exterior of the space chamber. This is a sealed cabin for experiments
and for the determination of human capabilities in a closed ecological
environment. Doctor Welch has shown the viewers the interior of the
cabin and the instrumentation. He is now showing the viewers the

exterior instrumentation, whereby those who are conducting the experiment can be in complete control of the situation and avoid any emergencies or causes for aborting the 30-day run in the sealed cabin. The second clip is a teaching situation where one of the Flight Nurses is demonstrating the SAM portable respirator. You have all heard of iron lungs. They are big, heavy, and cumbersome. Some of our personnel developed the portable respirator which was used on literally hundreds of mercy missions all over the world and is now used routinely in air evacuation flights and is available as a tri-service stock item. The third clip is a demonstration by one of the non-commissioned officers of the eye examination for phorias. I think this latter clip is a fine example of how the TV camera can bring to a large class a demonstration of a piece of equipment that only one person can see at a time when confronted with the actual equipment. Now if we can have the video tapes, this will conclude my part on the program. Thank you very much.

DR. KANNER:

We have been very fortunate in obtaining the services of a number of outstanding civilian personnel who have been active in the development of educational television. Our next speaker, Dr. George L. Gropper, Associate Program Director for Training and Education, American Institute for Research, has been doing some very interesting work related to the application of programming techniques to television instruction.

DR. GROPPER:

There's that old wheeze about a picture being worth a thousand words which is easy enough to throw out at conferences about instructional TV or instructional films. It's a statement, plus or minus a few qualifiers, which I think a majority of you would endorse. But, when it comes to stating reasons why a picture should be worth so many words, or when it comes to specifying ways to use pictures so that they are worth say, even a hundred words, I'm sure there'd be far less agreement among you. I think this is so despite the fact that research on instructional films goes back two or three decades and research on educational TV about a decade. The results of these research efforts have just not given us sufficient, definitive information about the role visuals can play in teaching facts and concepts. We don't as yet have rules or principles to guide us in selecting visuals which will do the most effective job of teaching particular facts or concepts. One of the reasons Dr. Kanner asked me here today is to describe some of the work on precisely this problem which we at the American Institute for Research have recently begun. Our work is being done under a U.S.O.E. title VII grant in conjunction with Metropolitan Pittsburgh Educational Television Station, WQED.

Before getting down to the specific research on the role of visuals in verbal learning, I'd like to point out two major ways in which the highly flexible audio-visual capability of both instructional films and instructional TV can be used to make them more effective. I pair films and TV in the same breath because I would be particularly hard pressed to identify instructional capabilities which are not applicable to both. With devices now available to blow up a TV image as big as the side of a barn, I think the similarities between film and TV far outweigh any remaining differences. Whatever differences there are appear to be either on the production side or on the presentation side. In the latter case there are obvious administrative and logistical considerations involved in the choice of either individual projectors and individual films for each viewing unit as against individual TV screens for each viewing unit with lessons originating from a central transmission source. But these are differences that are not likely to influence the learning process.

What can and does influence the learning process, among a variety of other influences, is the way in which both TV and films utilize their audio-visual capability. Both possess the capability of exercising systematic control over student or trainee learning behavior. Control over student learning behavior is made possible in both media by the following instrumental uses of their audio-visual capability: (1) they can control the amount of visual material presented in a given frame or the amount of audio material presented in a unit of time; (2) they can control the duration of exposure of these lesson materials; (3) they can provide an opportunity for students to respond to lesson content and control its duration; and (4) they can provide an occasion for feedback to students as to the correctness of their responses. Thus, both film and TV can physically control how much material will be viewed by students or trainees and can control the amount of time they will have to view it. In addition to this instrumental use of the audio-visual capability, it is also possible to concentrate on the selection of visual and verbal materials from an almost limitless range of possibilities and to present them in sequences suitable enough to stimulate appropriate student responses. In other words, it is possible with appropriate materials of either a verbal or a visual nature to enable students to come up with the right answers to questions posed during the lesson.

Those of you familiar with teaching machines and programmed learning will recognize that the description I have just given of the possibilities for exercising control over student learning behavior implies the use of TV as a highly flexible teaching machine. The teaching machine movement, you will recall, arose because psychologists recognized that either during lectures or during reading of conventional textual material poor control is exercised over student learning behavior. Specifically, this means that the lecturer or the writer has little control over which part of his presentation the student may be responding to; he has no knowledge of the correctness of the responses the student may be making since they are typically either implicit or covert rather than overt; and generally he provides no feedback to students as to the correctness of their responses. If he does provide feedback, it occurs at a much later time usually when a test is given some weeks after instruction. Programmed instruction seeks to avoid all these conditions. It exposes the learner to small segments

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of lesson material at a time thereby insuring that this is what the student will respond to. It prepares and presents lesson materials that insure the student will be likely to come up with the right answers. And by requiring a written record of responses, we know whether in fact they did come up with the right answers. It also offers prompt feedback to students about whether or not they are correct. This is what is meant by control over student learning behavior. It is this kind of control which can make learning more effective and more efficient.

This kind of control is also possible with TV. With it, instruction over TV can be more effective than when instruction consists of the conventional TV lecture. This is borne out by results of research which Art Lumsdaine and I did under a title VII grant and on which we have already reported. This is the first project I'd like to tell you about. In this project we conducted research attempting to show the value of utilizing student responses before, during, and after TV instruction as a way of improving it.

In an experiment we programmed lesson materials on how movies work. The lesson was presented orally. Although I don't intend to go into the problem here, I would like to mention that there are drawbacks to oral presentations in programmed instruction. Chief among them is the transitory nature of the presentation. Once words are spoken they are no longer present and therefore cannot act as a direct stimulus or cue to the responses we wish students to make. The use of printed materials presented and retained on the TV screen for prescribed durations avoids this problem. My current feeling is that spoken words can be used effectively when they accompany visual demonstrations. Here the visuals remain on the screen after the words are spoken. The visuals can then serve as cues even though the words are no longer present. Otherwise, for straight verbal presentations, it is perhaps preferable to use printed words which can be allowed to remain on the screen as long as necessary. The optimum mix of printed material on the one hand and visual demonstrations accompanied by oral commentary on the other will obviously differ for different subject matters. Its determination is an empirical matter that can be based on the levels of trainee motivation and attainment that it produces.

In the series of experiments in which we applied programming techniques to TV, we used a variety of approaches including oral and printed materials. Our results in general showed the superiority of programmed TV lessons requiring active participation over conventional TV lectures. But, not all students benefited equally from the lessons we prepared. High IQ students were able to profit more from our material than were students with lower IQs. How can we explain these results in which programmed lessons for group presentations did not benefit all students equally?

These results are due, I would judge, to key differences between teaching machine and television presentations. In programmed instruction with teaching machines or with programmed texts there is typically an interaction between an individual student and an individual device or book.

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In this arrangement all students are exposed to the same material but each student can pace his own progress and no student is likely to be left behind. Contrast this with group presentations, as in films or TV. Here there is an interaction between a single information source and many students. Not only is the content the same for all, but the pace is also the same for all. It is built into the lesson. Individuals at all levels of ability are expected to be able to learn from unvarying lesson presented at an unvarying pace. The greater the range of individual differences in ability in the group the less likely is instruction to be adequate -- unless of course an effort is made to pitch the lesson to the lowest common denominator.

In a second project we are conducting, also under a title VII grant, one line of attack we are using to try to solve this problem is to try to arrange for students to be sorted into homogeneous groups and to adapt instructional content and rate of presentation appropriately for those groupings. This is an attempt to individualize, to use a word that has great vogue these days, group instruction. This research is currently in progress and I have no results to present. I would like to mention in passing that we are exploring the possibility of determing whether each individual has a stable learning pace that is characteristic of him. Should this be the case, it might then be possible to create homogeneous groupings based on the characteristic learning rate that each student exhibits. The plan would then be to pace each of the groupings in a manner consistent with the self-pacing characteristic which was the basis for forming it. A collateral problem we are exploring is the possibility of exacting some gain from pacing of students if such a gain can be had. It is certainly conceivable that, within limits, forcing some students to maintain a particular pace may result in higher levels of achievement than would be the case if left to their own devices. It is certainly a position in sharp contradiction to the one I have spent some time describing but one whose merits nevertheless ought not to be prejudged.

Early in this discussion I indicated that I thought there were two major ways that the audio-visual capability of films and TV could be used to bring the trainee's learning behavior under systematic control. The first was by means of this audio-visual capability to exercise instrumental control over the amount of material presented in a given frame and over the duration of its presentation. The second major way to control the student's learning behavior is through the selection of lesson content which provides both the cues and context for student responses. It is in this way that the highly flexible audio-visual capability of films and TV can be exploited effectively. Not only can printed or spoken words be used to stimulate students to respond in particular ways, but visual presentations, either of a static or dynamic variety, can also be used to accomplish the same end.

In a third project I'd like to talk about the problem we are studying is concerned with finding ways to bring student behavior under the control of visuals whenever that seems appropriate or desirable. This means that

it is not enough to have a demonstration merely precede, accompany, or follow verbal commentary. Whether visual presentations are used to teach procedures or are used to teach facts and concepts, it is important that explicit trainee responses be brought under the control of explicit visual stimuli. During visual demonstrations trainees should be stimulated to practice particular responses and be required to record these responses. In this way we know what in the demonstration they are responding to and whether they are responding as we would like them to. When we use visual demonstration s to teach facts and concepts, what kinds of responses should trainees be stimulated to practice? Facts and concepts in such subject matters as science, for example, are essentially verbal in nature. The student in science is expected to be able to answer in verbal terms such verbal questions as, "What is the Bernouilli effect?", "How do we determine pressure at a given depth in a tank of water?". In teaching this kind of material we typically use visual demonstrations to aid students in acquiring a repertoire of verbal answers to these verbal questions.

How do visual materials accomplish the job of aiding trainees or students to learn verbal responses? That is essentially the question I raised at the beginning of this discussion and for which I indicated research has not as yet provided sufficient, definitive answers.

In the studies on visuals which I am currently conducting and on which I have reported briefly in an interim report, I have suggested two possibilities. One possibility is to use visual events associated with the particular words we wish to teach to serve as cues for those words. In this way students or trainees can be stimulated to practice using the words we wish to teach them and to use them in an appropriate context. For example, if we wish them to say that objects will weigh less when weighed in water -- we can submerge an object while it is attached to a hanging scale and demonstrate the decrease in the scale reading. After an object is actually submerged in water the decrease in scale reading can serve as the cue for the student response "weighs less." In addition to cueing verbal responses, visually perceived events can also provide confirmation to students as to the correctness of their responses. If they are required to predict what will happen in the demonstration, the actual events can serve to confirm whether their predictions are correct or not. So, for example, if a new object is submerged and students predict (to take a simple case) that it too will weigh less when submerged in a liquid, the object can then be submerged resulting in a decrease in the scale reading. This then provides students with confirmation that their prediction "weighs less" was correct.

In this use of visuals, the visual demonstration serves to cue and to confirm the verbal responses students make. We can control which words they practice by means of the visual events presented on the screen. We can thus bring student learning of verbal behavior not only under the control of verbal stimuli, as is the case when we show printed words on the screen, but we can also bring verbal responses under the control of non-verbal visual stimuli such as a science demonstration, for example.

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There is a second major way in which visuals can be used to teach facts and concepts. Trainees can be taught to make discriminations about demonstrational events and their interrelationships. Let's take the example of the apparent loss of weight again. Students can be taught to discriminate between the pointer positions for an object weighed in air and the same object weighed in water. Here students do not practice saying or writing that the reading will be less. They practice indicating in specially prepared workbooks where the pointer reading will be. Based on practice of such discriminations, students can then predict where the pointer will be for a new object submerged in water. As was the case when he was able to say in words that the submerged object would weigh less in the earlier example, his ability to predict the correct pointer reading is also indicative of his understanding of the concept of apparent loss of weight for submerged objects.

The choice of this example was not accidental. It was taken from a complete lesson on Archimedes' Law designed to teach students the equality between: (1) the weight of the liquid displaced by a submerged object; (2) the magnitude of the buoyant force exerted on the submerged object; and (3) the apparent loss of weight for that object. The lesson was an entirely visual one consisting of a programmed demonstration. Students practiced making discriminations about events in the demonstration and about their interrelationships.

By practice of all the relevant discriminations you saw and of others in the lesson, students acquired an adequate understanding of Archimedes' Law. This was measured by gains they made from pre-test to post-test. It was shown on test items that were pictorial, much like what they experienced in the lesson. It was also shown on test items that were verbal, and this despite the fact that in viewing this entirely visual lesson they did not practice making verbal responses. What they did practice was making visual discriminations and by practicing making these visual discriminations in a programmed visual lesson, seventh and eighth grade students acquired an understanding of Archimedes' Law.

One of the primary objectives of the overall project on the role of visuals is concerned with methods of integrating visual and verbal presentations. Toward that end, in the particular study I have been just describing, an entirely verbal lesson on Archimedes' Law was also prepared.

In this version of the lesson students practiced making verbal responses to verbal cues. This is in contrast to the visual lesson in which students practiced making visual discriminations in response to visual cues.

As part of our experiment students got to see both visual and verbal versions of the lesson. Some students viewed the verbal version before seeing the visual version. Some saw the verbal version after seeing the visual version. Without going into more detail about the design of the experiment, I'd like to summarize some of our findings and to draw some tentative implications from them.

When a test was administered to one group of students after they had seen only the visual program and to a second group after they had seen only the verbal program, the results indicated that both groups had made significant gains in the amount of knowledge they had about Archimedes' Law. The average gain for each group was 25 percent. Students were able to profit from either the visual or the verbal lesson. There was no significant difference between these groups as to the extent of the gains. However, on a more detailed analysis of test scores by type of test item, significant differences did show up. On pictorial test items students who had practiced visual discriminations during the visual program made gains of 25 percent as against gains of only 10 percent for students who had practiced making verbal responses during the verbal program. A tentative generalization I would like to draw from this finding about performance on pictorial test items is that, if we wish students to be able to observe and make accurate dis- criminations about physical events, visual discrimination practice during learning appears to serve that purpose better than practice of verbal responses about the same events. This generalization would appear to be applicable to science instruction or instruction on the operation of technical equipment. In both instances the student or trainee is expected to be able to make observations and judgements about visually perceived events. Visual discrimination practice involving the same events or involving similar events seems to facilitate this kind of attainment.

In the case of the ability to deal more abstractly in words about the same events, practice in making verbal responses appears to be preferable. The results of our experiment indicated, however, that this was true only for high IQ students. On verbal items testing student understanding of Archimedes' Law, high IQ students who had viewed the verbal program made gains of 37 percent as against the 19 percent for the high IQ students who had viewed the visual program. On the same verbal test items there was a tendency among students with lower IQs to profit more from the visual than from the verbal program. Thus, there may be differential ability among students to learn concepts from concrete visual presentations than from the more abstract verbal presentations. One direction individualizing instruction might take in addition to altering such factors as the rate of presentation, the amount of review, the strength of cuing, etc. would be to use different instructional approaches to match student aptitude. In more concrete terms, the blend of words and pictures which is optimum for students with lower IQs may differ considerably from that which is optimum for students with higher IQs. In our continuing research on the role of visuals in verbal learning we intend to continue paying attention to these possible interactions between individual differences and type of presentation.

In comparing the achievement of students after they saw both versions of the lesson, we found that students who saw the visual program first followed by the verbal program made significantly higher gains than did students who saw the same programs in the reverse order. The gains were approximately 40 percent for the visual/verbal order as against 22 percent

for the verbal/visual order. While both these lessons were complete lessons, it is certainly conceivable and quite probable that lesson segments of shorter duration could be sequenced similarly, that is visual, verbal, visual, verbal, and so on. I think the implication to be drawn from these results is that visual discrimination training concerning the events of a demonstration familiarizes students with the events of a demonstration. It serves to label, as it were, the key parts of the demonstration and to show how they are related. When the more abstract verbal account then follows, it is perhaps easier for students to make the connection between what they have seen and the words they now hear. The appropriate words can more readily be attached to the appropriate parts of the visual demonstration. (Parenthetically, I would like to suggest that the same kinds of discriminations about events might be built up by having students practice words associated with the demonstrational events. But that is something we did not explire in this experiment.)

Interest in the kinds of research problems I just described arose out of our experience in observing the kinds of errors students made watching demonstrations presented in a conventional way. By the conventional way I mean merely accompanying a verbal commentary or being accompanied by it. One demonstration in particular comes to mind. It had to do with the bending of a bi-metal bar which when heated closed an electrical circuit and rang a bell. But I'm afraid the demonstration didn't ring a bell with our seventh and eighth graders. They failed to make the appropriate discriminations concerning the events of the demonstration. Some of them attributed the ringing of the bell to the flame of the match. While this occurrence is from our work with seventh and eighth graders, I'm sure that there are demonstrations of greater complexity presented to adults which undoubtedly create similar confusions when there are no systematic efforts to build up necessary discriminations among physical events or physical objects.

I would like to cite very briefly a final result from our study on the role of visuals. There was marked superiority in performance by students who actively responded to our lessons as opposed to students who viewed an alternate version of the same lesson which did not require such active responding. The gains were 65 percent and 20 percent respectively. This provides still further confirmation for the benefits of techniques calling for active participation.

Let me summarize the main points I have been making:

From the programmed instruction movement we have learned about the importance of exercising systematic control over student or trainee learning behavior. In practice, this has meant presenting small amounts of material to students, requiring them to respond explicitly to that material, and providing feedback as to the correctness of their responses. Results from research to date indicates that applying the same approach

to TV can lead to significant improvements over conventional lecture
presentations. Further, it was suggested that demonstrations used
to teach facts and concepts to be maximally effective require the same
approach. Demonstrations should not merely precede, accompany, or follow
a verbal presentation. As the verbal material in a verbal presentation
can be used to exercise control over student learning behavior, so too
the visual demonstration. Student learning behavior during demonstrations
can also be brought under the control of the visual material. The kinds
of behavior so brought under control can be either verbal responses or
visual discriminations. One of the key functions served by either type
of response is to label properly the events of the demonstration and their
interrelationship. This would appear to facilitate student understanding
of the verbal portions of a lesson which refer back to and depend on the
demonstration. This is one of the ways our preliminary research findings
indicate visual and verbal presentations can be integrated.

It is not enough merely to add a visual to a lesson and complacently
assume that the lesson has thereby been improved. Unless its function in
the lesson is explicity specified and its use designed to elicit particular
responses, the visual, rather than promote its intended purpose, may defeat
it.

DR. KANNER:

I may appear a little partisan in introducing the next speaker.
He will present one of the first descriptions of the results of an
extensive television study recently completed at the basic training
center, Fort Dix, New Jersey. Having spent many months in the design
and execution of this study, I am pleased that it was ready in time for
exposition at this conference. Describing this study is Lt. Wesley
Marshall, Television Division, Army Pictorial Center, New York.

LT. MARSHALL:

Television in basic training is not new to the Army. Dr. Joseph
Kanner, your host at this conference, was project officer for HUMRRO,
on an evaluation they conducted for the Army of this concept in 1953.
This early study was designed to obtain basic information on the
comparative teaching effectiveness of television and the Army's regular
basic training instruction.

Conducted at Ft Gordon, Georgia, the project provided us with
considerable knowledge of television's use as a basic training device.
Among other things, it indicated that "television instruction was at
least as effective as regular instruction and television instruction
was remembered at least as well as regular instruction."

To those of us in the field of television research, these findings
were indeed significant. Not only did television instruction in basic
training appear feasible, but the results suggested a possible solution
to future Army mass instructional requirements.

Although TV's use as a training device was considerably expanded in
the mid and late fifties, the emphasis was primarily in the area of
advanced technical training as conducted at Ft Monmouth and other similar
installations. Not until President Kennedy's mobilization order in
late 1961, was it possible to consider seriously further studies on this
subject. At that time the Armed Forces, and particularly the Army, was
faced with a tremendous teaching requirement, and consequently a shortage
of trained instructors. This expanded training requirement provided an
ideal opportunity to reconsider television's use in basic training.

Armed with the results of the Ft Gordon project, representatives
of the Office of the Chief Signal Officer informally discussed the concept
of television in basic training with Deputy Chief of Staff for Operations
personnel. As a result of these meetings the Chief Signal Officer proposed
to DCSOPS that an opportunity be provided for an application of television
in current basic training. This proposal was accepted by DCSOPS and
CONARC and the Ft Dix project began to assume the form of a large scale
study.

As originally established, the Ft Dix experiment would have two
major objectives: (1) To specify in greater detail the potential use of
television for mobilization requirements, and (2) To determine the role
of television in facilitating peacetime basic training.

In early February of this year, the Pictorial Center's television
production facility and its Applications Development Branch were assigned
the operational phase of the project. Dr. Kanner outlined and discussed
the project design with Lt Col Hugh C. Oppenheimer, Chief, Television Division,
Army Pictorial Center and members of his staff. In simple terms the study

would attempt to answer the following questions: (1) What percentage of basic training instructional hours could be presented by television? (2) How effective would this instruction be compared with conventional training? and (3) Can television facilitate training in areas other than straight daytime instruction?

To answer these questions an elaborate-study was established involving five basic steps:

(1) The Pictorial Center would record for TV presentation as many daytime basic training instructional hours as possible.

(2) Television would be utilized in areas other than straight daytime instruction in an attempt to facilitate training.

(3) A controlled population would be selected to whom the TV instruction could be presented.

(4) A testing program would be devised to measure the effectiveness of television instruction.

(5) The results, of course, would be analyzed.

The project was formally started in late February 1962. A little over three months were provided to accomplish the preliminary work necessary to begin a 1 June training cycle.

Production personnel from the Center moved to Ft Dix in March to begin observing classes and selecting both the subject material and qualified military instructors. An attempt was made to choose the best instructors available from Ft Dix for the television presentations. A total of 56 daytime hours were chosen for recording. Instructors, training material, and visual aids were brought back to the Center's television studio for the actual recording sessions. Due primarily to a complete lack of experience in television work, some of the instructors were replaced by professional actors as the project developed. An attempt was made throughout the production to utilize some of television's inherent teaching capabilities. Superimposures, split screens, lens magnification and other similar techniquest were integrated into the instruction when possible. However, television's teaching capabilities were not uniformly utilized throughout the recording. As an example, existing graphics were frequently used to conserve time and for the most part these were not ideally suited for television use.

The second project step or utilization of television in other than daytime instruction proved to be quite interesting and may well be the one of the most significant aspects of the study. Several years ago HUMMRRO experimented with a "Review-Preview" concept of learning in basic training. Essentially, this technique involved the use of instructors to Review and Preview training in informal evening barracks sessions. It occurred to Dr. Kanner that such a technique could be greatly expanded through television.

The HUMRRO application only covered three days at any one time: The current day's training, the day before and the day after. One instructor, however, on a closed circuit television system, could reach an almost unlimited number of trainees and cover by video tape large blocks of training. Essentially the use of television could considerably expand the Review-Preview concept.

Provisions were made, therefore, to provide the trainees with a fairly elaborate evening Review-Preview Presentation throughout the eight weeks of their training cycle.

Based on the daytime training schedule, an extensive series of pre-recorded 15 to one hour presentations were planned. Since this is a fairly new concept and somewhat difficult to describe, I would like to pause a moment for a detailed explanation.

Basically the trainees would receive, by television each evening, a Review of their day's training and a preview of the coming day's activities. However, one gets into a semantic problem in trying to describe just how these programs were constructed.

In essence each evening's session was composed of pre-recorded segments edited together into a sequence appropriate for the training covered. The TV Division's mobile field units recorded 26 hours of 5 to 15 minute segments during the month of May. This material covered such "outside" training activities as Bayonet instruction, Trainfire, Squad Tactics, Infiltration Course, Army Drill and other similar subjects. At the same time the formal daytime classes were being produced at the Center, review segments in such areas as Military Justice and Land Navigation were recorded using the actual class instructor. To tie all of this together and to handle relatively uncomplicated material like Achievements and Traditions, a Ft Dix Sergeant was chosen to serve as a narrator.

Thus a typical review-preview session might be composed of all of these elements. As an example, the narrator might open the evening's session with some comment appropriate to the day's training. He would review the high points of some classes or introduce the class instructor. When the major points of that day's classes had been covered, the coming day's activities would be previewed. In the case of classroom subjects the narrator would preview in general terms the material contents and provide an explanation of the subject's importance. If the trainees were scheduled to receive an outside field subject such as Grenades or Squad Tactics, the preview consisted of a taped segment actually showing them the general class area and the activities in which they would be involved.

Thus, during an eight-week cycle, every topic area would be covered to some degree in the review-preview sessions. In addition to this type of information the evening concept would provide other material. At the completion of each week the trainees would receive a review of the entire

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week's training and a preview of the coming week's activities. On several occasions throughout the cycle, the Deputy Post Commander was scheduled to make a television appearance to bolster morale, and provide a learning incentive. As appropriate throughout the eight weeks, the closed circuit system would be used to present information of a current news interest.

Even though the daytime training schedule was to be held constant with little or no changes from day to day, we anticipated some scheduling problems. Therefore, a mobile production and recording facility was planned at Ft Dix to handle any changes throughout eight weeks.

To measure the effectiveness of television in basic training, we, of course, needed two entities: a test population and some method of measuring learning. Using the Armed Forces Qualification Test Scores as a basis for selection, two matched companies were formed as trainees entered the Ft Dix Reception Center. When the companies were up to strength a coin was flipped to determine which unit would receive its instruction via television. The TV group, or November Company, would receive 56 hours of television instruction and the evening review preview presentations. The control unit, or Mike Company would receive its training by conventional means. At first glance this might appear as an odd comparison. The TV group through evening Review Preview, would receive about 45 additional hours of instruction. But remember we were interested in finding out how television could <u>facilitate</u> or perhaps improve training. The evening sessions, on the scope that we planned, would be feasible only by television. If such a technique were integrated into post-wide training it would be impractical to place one instructor on each floor of a company barracks for review-preview.

To give us a broader base for evaluation, six other training companies were chosen at random from Ft Dix, Ft Jackson, South Carolina and Ft Ord, California. All of these units, in addition to the TV and Control Company, would be tested in some degree to strengthen our evaluation.

The problem of testing became a very significant one early in the project's development. Basic Army Training Facilities do have tests to measure what the trainees have either learned or the skills they have achieved, but they are somewhat limited in scope. These devices take the form of a Proficiency Test administered at the completion of an eight week cycle, and the scores achieved in Rifle Qualification.

Although these are measurement devices, they are neither as extensive or as precise as we desired. Somewhat to our surprise, we further discovered that a complete, up-to-date, series of basic training tests did not exist. Therefore, the Applications Development Branch constructed and pre-tested 30 individual multiple choice subject examinations and a 240 item master comprehensive test. The individual subject examination would be administered immediately upon the completion of the class and the large test would be given at the beginning and end of the cycle. As you may realize, this design would give us a measurement of television vs conventional daytime training as well as a separate evaluation of Review Preview.

In conjunction with the testing program, Dr Kanner was interested
in some measurement of unit morale and of the visual reinforcement potential
of television. Thus a morale test was administered to the TV and control
group and a "Graphic Examination" was composed. The latter test consisted
of a series of 35mm slides representing pictorial items.

All of the activity that I have described thus far, took place between
late February 1962 and 13 June 1962. The two primary companies began
their cycle on the 12th of June and thus also began the playback phase of
the project.

To provide both a break in this narrative and a small insight into
what this project involved in the area of television recording, I have a
short edited video tape for your viewing.

V I D E O   T A P E

The eight week training cycle ended in early August and the analysis
began. You'll recall that our first objective was to record as much of the
basic training as possible. The Army Training Program at Ft Dix under
which we worked, consisted of 401 training hours. Although it is extremely
difficult to break these training hours down into their specific purpose or
use, we can generalize to some extent. Disregarding administrative time
consumed in troop movements, processing, or orientation, and night training
activities, there are about 290 training hours devoted to actual instruction.
Of this figure, approximately 200 are practical application skill learning
activities such as rifle range firing, Army Drill or Physical Training.
Thus in very general terms from a total of 401 training hours about 90
could be considered for possible television recording. This type of break-
down is essential in understanding the importance of the 56 hours actually
presented by television. Obviously such activities as night training or
range firing are not suitable subjects for television instruction. In
common training terms, television can introduce, explain, demonstrate,
to some degree critique (this type of training) but it can do little more
than support practical learning or (the application) of a skill. Using
trainfire as an example, television could logically be expected to introduce
the weapon, explain and demonstrate its use and function, and perhaps
critique its use, but this is about all the support that it could provide
for trainees' actual range firing.

So, of the 90 hours possibly available for television presentation,
56 were recorded. These subjects were presented without altering the
teaching approach. In other words the lesson plan was practically unchanged
when the class was recorded. Given more production time and the opportunity
to alter somewhat the approach to other subjects, we estimate a total of 76
to 82 hours could be presented by television.

Although we have administered and graded all of the examinations
our results at this point are approximate. We have not had sufficient
time to match completely the companies for a true analysis of the results.

However, there are apparent trends developing. On the basis of the individual subject tests given immediately after the class instruction and consequently before the review preview, the results suggest that the TV and control group were about equal. Although there were a few isolated examples of higher scores in the TV unit, the results are following the trend of the Gordon study in that television instruction was at least as good as conventional training.

The results of the evening review preview are showing up in the master examination scores. Again I repeat that our current analysis is based only on non-matched comparisons. In other words, these are company mean averages computed with no attempt to alter the AFQT range in any group. We, of course, could not control the AFQT scores in the randomly selected groups so they may be higher or lower in aptitude as measured by the qualification scores. On this basis, the TV company had a mean score of 147, the control group 136 and the other six companies ranged from 113 to 133. We think that the matching process.. or the arranging of the population so that the members of a Ft Ord company as an example, exactly equal the AFQT scores in the TV company will probably increase the difference in performance. As it now stands on an unmatched basis, the Television group scored anywhere from 10 to 35 points higher on the master test than conventionally trained unit The graphic examination is also graded but we do not have a refined analysis.

Looking at Ft Dix's own measurement devices we find that the television unit did as well as or better than the conventional company. Both had about equal average scores on the proficiency test. The TV company qualified 100 percent of its personnel in the proficiency test and the control company somewhat less than this percentage. The Television group also qualified 100 percent of its personnel in trainfire. This feat is quite unusual at Ft Dix, occurring about once in every 100 companies.

At this point in our analysis it appears that television did facilitate basic training. Generally speaking the favorable effects fall into five categories:

(1) Instructional man hour savings through recorded television presentations.

(2) Increased practical application of learning in some class areas.

(3) Increased learning through the use of review preview presentation.

(4) Decreased administrative handling time in some class areas.

(5) Utilization of the closed circuit barracks system for presentati< of informative news material, and administrative announcements.

We estimate that the presentation of 56 daytime hours relieved about 150 instructional man hour requirements. This figure was derived by multiplying the number of instructors normally required to present the 56 hours, times the length of the individual classes involved. This, of course, disregards the instructor time consumed in producing the instruction.

Obviously if television were implemented as a regular portion of basic training the manpower savings would increase with each class presentation. The 50 instructor hours in this case represent one company in one eight week cycle.

In most instances the use of television decreased the amount of time required to present any given amount of subject material. Consequently in classes where practical application followed learning, the trainees were given an opportunity to spend more time developing their learning or skill.

The review preview sessions appeared to facilitate basic training in several areas. The 45 hours additional subject coverage alone seemed to enhance learning. By running an item analysis on each subject test we were able to determine weak areas in instruction and re-program the material back into later review sessions.

The preview portion of the evening programming also facilitated training. The cadre discovered that when the trainees were given an opportunity to observe training formations and exercises the evening before the class, the amount of administrative handling time was decreased. This particularly occurred in such subject areas as Physical Training and Army Drill.

As far as non-instructional use of the closed circuit system was concerned, the Deputy Post Commander utilized the system on two occasions to reach the trainees and on several occasions the system was used to present National news items.

To review for a moment the results of the project in reference to the questions posed they can be summarized as follows:

(1) 56 of 90 possible basic training daytime instructional hours were presented by television. An estimated 76 to 82 could be recorded.

(2) In the area of daytime subject material, television instruction was as effective as conventional training.

(3) Television did appear to facilitate basic training by increasing learning throughout the use of 45 hours of review preview material. It also facilitated training in certain instructor and administrative time savings.

It would appear therefore that both television's potential as a mobilization instructional device and its role in facilitating peacetime instruction is quite promising if not significant.

We cannot, of course, accurately predict future applications at this point. There is still a great amount of computation and analysis to be accomplished. However, it does seem that the Dix project has provided what may well be an answer to not only one of the Army's major training

problems, but the critical instructor shortage that always seems to face the Armed Forces. The utilization of televised instruction on this level of training could release a fantastic number of qualified instructors to be used elsewhere in training program. Although the initial cost of televised instruction is moderately high, the monetary savings over a long range period could be extremely significant.

The Ft Gordon study provided us with an excellent insight into the reliability and practicability of television's teaching potential. We have, through the Dix project expanded this insight and considerably reinforced the adaptability of television to basic training. Here then is a potential capability to not only alleviate a critical training problem, but to perhaps solve it.

DR. KANNER:

Thank you, Lt. Marshall.

Our next speaker, Captain John Haney, will describe the use of television at the U. S. Air Force Academy, Colorado. The system is different in many ways from those previously described and should be interesting from an equipment and attitude viewpoint. Captain Haney is Assistant Professor of English and Chief, Television Division, Directorate of Instructional Research, U. S. Air Force Academy.

CAPTAIN HANEY:

Today, 19 October 1962, out at the Air Force Academy in Colorado Springs, we are using our new closed-circuit television system for seven hours of live programming. This television system is operated by the Television Division which consists of one person: me--and I am here in Virginia.

If the amount of programming and the size--and absence-- of the staff do not seem to match, it is because the Academy television system differs from the usual television pattern and practice, and it represents a radical departure from conventional television production.

First, a word about its conception.

In searching for ways in which television might further the academic program at the Academy, we looked at the medium from the standpoint of the instructor, and asked the key question, "What can television do to assist the instructer in presenting his lessons?" (The assistance in distribution of lessons is obvious.) The answer is that basically the instructor wants his students to see a good-sized, clear image of himself, and in addition, a view of all kinds of visual materials: charts, diagrams, photographs, book pages, real objects, lists, etc. The instructor wants to control the flow of information to the student.

With this objective in mind, we soon determined that the standard pattern of television production (carried over intact from commercial broadcasting to educational situations) was not only more elaborate than necessary, it lacked the vital characteristic of instructor-control believed essential in our academic program with our instructors.

The Academy closed-circuit television system was designed to allow the instructor to make full use of the characteristics of the medium and available resources, while retaining the instructor's prerogatives and responsibilities. In essence, the system consists of two fixed broadcast-quality vidicon cameras, without operators; one picks up a head-on view (through a 45° mirror) of a portion of the teaching desk on which the instructor may switch or fade from camera to camera, or zoom in and out on the visual material by operating the controls located on a small panel directly in front of him. Two small monitors show at all times what each camera is picking up, and a large line monitor shows what the students are seeing in the classrooms. One camera can also pick up the image projected by a 16-mm sound motion picture projector of a 35-mm projector.

(Here Captain Haney showed eighteen slides to illustrate the operation of the one-man instruction-centered television system.)

Of course, such a system will not produce everything that a conventional production arrangement can. For example, the excellent dramatic presentation of a case history in leadership which we saw this morning, produced by the Army Signal Corps Pictorial Center, could not be done on our system. However, taking a hard and realistic look at the whole field, we feel that our kind of system can accommodate up to 90 per cent of the instructional and informational presentations for which most college and military installations use television.

The important point is this: television users now have an alternative means of production to use where appropriate. We are no longer faced with an "either-or" situation, where one must set up a complex television studio and gather an extensive production staff in order to use television at all.

Moreover, we feel that such a television system is an ideal way for a potential television user to begin television activity, for it allows gradual experience for the key television persons, acceptance by the instructional staff, and encourages integration with other activities to further the assigned mission. To be specific, we often heard that television and programmed learning divisions are part of the same unit. The result is that our television lessons incorporate principles of programmed learning, combining written programs, immediate student response, oral presentation, and follow-up discussion to comprise a complete instructional system.

This last point brings up a key issue in televised instruction at the Air Force Academy. To have the instructor do his own lesson preparation -- including programming of material -- as well as control the presentation means that we must start with highly competent instructors. This is not a handicap; it is our greatest asset. The mechanics of operating the Academy television system are of secondary consideration, for they are easily mastered. Our primary concern is with the instructor's depth of knowledge, pertinency of experience, and skill in communication so that his presentations can be authoritative and contributive, rather than imitative and derivative. If the Academy television system provides no place for the "pooped-up puppet," it is not because he does not belong in television as much as because he does not belong in education.

In Herman Wouk's novel The Caine Mutiny, one cynic points to a complex of military hardware and says that it was designed by geniuses to be run by idiots. I think that this is an unfortunate comment on the military. Even though I had a hand in designing the Academy television system, I prefer the comment of a local television person when he saw our system: "This was designed by idiots to run by geniuses."

No, not geniuses -- just fine instructors, for whom television
provides a means of perfecting and extending their presentations,
in their own ways, to meet the educational needs of our institutions.
We have used it this past semester for courses or individual lessons
in aeronautical engineering, academic skills, mathematics, technical
writing, geography, psychology, and reading.

If you would like more information about this system, please
write for a copy of a 32-page booklet that we have prepared for this
purpose. Use the following address:

> USAFA (DFRI-TV)
> U. S. Air Force Academy
> Colorado

We are not trying to sell anyone else on a system exactly like
our $35,000 one. We do suggest that the design of any television
system be carefully worked out to fit definite operational needs,
rather than standard patterns. We feel that the basic elements
of the Academy system can be adapted for many kinds of instruction,
not necessarily limited to the college level, and for virtually
all of military informational presentations or "briefings." This
kind of system is not meant to replace, but rather complement more
elaborate production-centered systems, so that each can be used for
the tasks most appropriate for it.

You are welcome to visit our installation and see for yourself
how it operates.

MR. DOLAN:

The use of television for making training and informational films
is growing in importance in the Armed Forces. At present, the Air Force
does not have a centrally located facility employing television recording
techniques for Air Force wide use. Instead, individual installations,
such as Lowry Air Force Base, possess kinescope recorders. Both the Army
and Navy do have such centrally located installations. One of these is
at the Army Pictorial Center, New York. Here to describe their use of
television for recording is Lt Colonel Hugh C. Oppenheimer.

COLONEL OPPENHEIMER:

As has already been indicated by Col Dakin, Dr. Kanner, Col McCleery,
Lt Marshall and Mr. Flaherty, the Television Division of the Army Pictorial
Center is involved in many areas of TV operations.

Included are:

1. APPLICATIONS DEVELOPMENT: i.e., the exploration and development
of military applications of TV - such as --

2. FIELD SUPPORT - TV field support of our own projects - Dix study
and others assigned by D.A.

3. PRODUCTION OF TV PRESENTATION. In conjunction with other two
and includes production of films.

I am not going into any of these operations except "the use of
TV for producing Training and Informational Films." Perhaps should be
added to this "for theatrical - as opposed to TV - release."

The TV Division is a part of the Army Pictorial Center. The Pic
Center - as you may know - is the primary agency for producing DA films.
However, the production of films, per se, had nothing to do with assigning
the Signal Corps TV mission to the Center. It was merely that TV and
Motion Picture production were allied fields. When I was given the
responsibility by the Chief Signal Officer for developing a TV program
in the Army in 1952 - TV as a film production means was not even a gleam
in anyone's eye. By that time, however, the Signal Corps had accumulated
some TV equipment, including a large hulk of machinery identified to me
as a Kinescope Recorder. When I was asked what I expected to do with it -
I said, "We expect to use it to produce training films." Many times I
have regretted these words. But now, I think it has turned out to have
been a good answer and has been realized.

In producing films we work next to, and in coordination with, the
motion picture production activity of the Army Pictorial Center. Both of
our film production programs are derived from the DCSOPS approved training
film requirements and other DA approved sources.

You're all familiar with what constitutes a television system,
I'm sure.

Our system at the Pictorial Center is relatively standard, varying
from any other TV studio facility perhaps only in the types and kinds of
equipment used. Our production, then, of training films is similar to any
other television production, except, of course, few of the other television
installations and up with a television film or kinescope for MP release.

Realizing the complexity of the television system, the question is
raised - Why produce films by television? This brings to mind a recurring
dream which my Chief of Production says he has been having. In this dream,
television was invented before the motion picture camera and for years
films were produced by the televisiontechnique, necessarily going through
the whole complex electronic system from cameras to kinescope recorder.
Suddenly, one day along comes a man who claims a revolutionary invention --
a system by-passing all of these electronic facilities and consisting only
of a mechanical device that allows the image to go directly from lens to
film. This system he calls a "motion picture camera" and, I suppose, had
this dream been true the television production people would have looked upon
the motion picture camera as truly a revolutionary development, particularly
if they had been plagued by questions of image quality and suddenly found
themselves with a system that could produce the high image quality possible
using a motion picture system.

The question of doing films by television becomes significant when
the factor of quality is considered. We know that reduced image quality,-
up to a certain degree - does not necessarily reduce teaching effectiveness.
However, a television film is going to be compared with a standard motion
picture film whether we like it or not. By comparison it traditionally has
not reached motion picture quality. Television film production at the
Pictorial Center has sat next to motion picture production since the
beginning, and all television films have been forced into a comparison with
motion picture films. Although we have consistently damned this fact, it
actually has been good because it has forced us to reach for motion picture
quality. I feel that since the first kinescopes were produced at the
Pictorial Center we have come a long way. There is still some distance
to go but you've seen Mr. Flaherty's films and know what is now possible.
Still -- considering the complexity of a television system, the question
of "Why television techniques" rather than motion picture is raised? The
answer lies in two axioms, both of which apply to any business, but
particularly to the film production business. Thefirst of these is
"Proper Prior Planning." In television proper and prior planning is a must.
We have no choice by the very nature of the medium. The importance of this
was brought by Mr. Bronson last nite. Proper prior planning tends to
pre-solve problems and save production time. That leads to the second axiom
which is "Time is Money."

As you know, the standard method of shooting a motion picture film is:
set up and light for a long shot, re-set up and light for a medium shot,
then move in for your closeups, and finally, pick up your inserts and
reaction shots. In television this is pre-planned and generally done as

a continuous action, as you all are well aware. Proper television production mandates that every aspect of camera action, switching, acting, lighting, movement, all be planned and rehearsed well in advance of going into the expensive phase of "on-stage" production. Consequently, time is saved and where costly talent and facilities are involved. This time is very definitely money. From that point on there is the question of handling the film itself. Film, in long takes, with the editorial phase accomplished electronically, as can be done in television, can be handled considerably faster than can the bits and pieces as normally shot by motion pictures. This of course reduces the cost and increases the output rate.

One other item. When television began, the people working in the field were novices. They tried many things that anyone experienced in production would have avoided. They made mistakes. They also learned new techniques. They were forced, for example, to deal with the small television screen and small budgets. This meant that fancy, elaborate sets rapidly reached the point of diminishing return. This factor led to the use of limbo or cameo techniques.

You have heard Col McCleery discuss the Limbo and Cameo techniques and their benefits -- so I won't go any further into this except to say -- properly used, these techniques not only improve the end product, but tend to reduce costs.

I don't want you to misunderstand or think that I'm trying to say television can do all things faster and cheaper than they can be done by standard film production techniques. Television is effective for dramatic productions, technical subjects involving visible operations, lectures and chart presentations, assembly and disassembly of equipment, or most any subject which can be shown in continuity where real time is the same as presentation time. However, a television production runs into problems when it must deal with extensive animation or special effects and-currently-location shooting, unless it's nominal; closeups in tight quarters where the TV camera cannot fit, such as in a tank turret, for example, or extensive movements of equipment and personnel. Then, too, at the present state of the art, television cannot meet requirements for color films. What I am saying is, that there are certain productions that television is geared to do and can do effectively at a time and cost savings at the same time providing a good quality training and informational film.

The Pictorial Center rescores certain films in various foreign languages. It has been found where some scenes must be replaced because of such reasons as their visual English language content, the rescoring of the films, and reshooting of the few scenes can be done very well using TV. I would like to show you part of one such film -- only to give you an idea of the quality of TV vs motion picture production as we cut back and forth between the two in this film.

I would like to end my talk by showing you one of a series of an "open-end" leadership films wherein the problem created in the film are not resolved but left to the audience to resolve. I think it is a good example of a type of TV training film that I have been discussing.

Particularly, I would like to call your attention to the first scene and point out that this was done with only one camera. I think you can see that the flexibility of a television camera, as it is demonstrated here, gives another advantage of producing films by the television technique.

MR. DOLAN:

Our next speaker, Lieutenant McLaine, will describe the television effort of the U. S. Navy Photographic Center, Washington, D. C.

LT. McLAINE:

I would like to thank Dr. Kanner and others who invited me to attend and participate in this, the third Armed Forces Television Conference. We welcome this opportunity to learn how our counterparts in the Army and Air Force are using television and to explain how we at the Naval Photographic Center employ this modern teaching tool as a means of making training films.

The function of the Television Branch at the Naval Photographic Center is to produce via television and film recording; training films, film training aids, progress reports, and services for the Naval establishment. The Television Branch supports and supplements the existing motion picture production capability on films where the emphasis is placed on speed and economy. The Navy's experience in television recording goes back to some early experiments in 1945 and 1946 with airborne television. In 1949, LCdr W. R. Fraser and R&D engineer G. J. Badgley scored a real first, when a color kinescope was made at the Photo Center. The Navy's first training film produced via television was recorded using demonstration equipment at the Photo Center in the latter part of 1949 and released in 1950, incidently, the film, entitled "Final Inspection of Industrial Gauges" is still listed in the Navy's training film catalog. The Center first received two vans of surplus television equipment consisting of three I. O. Cameras, a audio pickup system, A GPL kinescope recorder and rapid processor from the Navy Special Device Center on 25 May 1958. On board personnel placed the special devices portable field type equipment in semi-operational condition and successfully recorded a three minute presentation on the Photo Center's stage, which demonstrated the feasibility of permanently adding television recording to the Center's mission. In March 1959, the Photo Center negotiated for and completed the transfer of the U. S. Naval Academy's broadcast standard closed circuit television facilities. This equipment consisted essentially of two RCA TK-31 I.O.'s and iconoscope film chain, sync generator, switcher, and associated equipment. Space adjacent to the sound stage was made available and a permanent installation made. The lack of professional technicians presented varying degrees of difficulty and growing pains and the first 20 minute film was made in May 1960. This film gave personnel a chance to explore every possible aspect of the TV installation including extensive operational training for the crew. During the ensuing months, the TV Branch approximately produced 40 kinescopes of varying lengths and content. Over this period of time it was apparent that in order to improve the quality of our final film product, new equipment would have to replace some of the old and absolete equipment in use. With command and Bureau of Naval Weapons approval of television as a means of film production, a program of constant replacement of equipment was effected. Our present up-date installation consists of the following type of equipment:

One 4½ inch, image orthicon camera and two 3 inch, I. O. cameras, delivery of two addition 4½ inch I. O. cameras is scheduled for next week. A transistorized, switching/special effects system, two GPL 16mm kinescope recorders.

One vidicon film chain with a 16mm projector and a random select slide projector and the necessary power and distribution equipment.

Just a week ago last tuesday, we took delivery on a fully trans-istorized television tape recorder. This broadcast standard, quadrature head machine is now in operation at the center and when I left Tuesday we were preparing to make our first tape to film transfer off of this machine. The Photo Center's 60 x 90 foot motion picture sound stage is used as our studio and has recently been equipped with a lighting grid system and a control dimmer panel able to accept 144 different lighting circuits. Our audio facilities are integrated with the existing motion picture sound recording branch for ¼", 16mm and 35mm, both optical and magnetic recording. We utilize a ¼" tape recorder for inserting music and sound effects into productions from our booth located adjacent to our master control console. Since full operation with some of the newer equipment, we have produced a total of approximately 20 films. Films produced via TV techniques has proven advantageous in time and cost; synomonous terms perhaps thru the eyes of the comptroller. The economy associated with TV production of films is directly related to the savings of labor and the elimination of the time consuming steps normally associated with film production. I would like to sight two examples which point out the saving in time associated with the production of films via television. The Marine Corps requested a 20 minute film entitled "Aptitude-Area Classification Testing." The purpose of the film was to provide Marine Corps personnel with an explanation of a new system of classifying recruits. Due to the short time spread between the date of request and the desired release date, the project was assigned as a tv production. The script was approved on Monday, September 18, sets built on Tuesday, rehearsal on Wednesday, and recorded on Thursday. The distribution of prints was made on 2 October or just 16 days after script approval. Another production for the Internal Revenue Department, two and one half hours in length was produced in a period of one week, with rehearsals Monday and Tuesday, and recording on Wednesday, Thursday, and Friday. The set, a complete courtroom, was built in a period of one week by personnel of our stage section. As mentioned earlier, production via television is indicated when minimum time or cost or both are the dominent factors. Normal films production is traditionally slow due to editing, optical effects, and sound mixing. As most of us know, these production techniques are sometimes needed and useful but using television electronics, are accomplished during production. I would like to interject at this point that being in a motion picture environment at the Photo Center, the degree of film quality is under constant scrutiny. We feel that although optimal quality of films is important, the information they contain and the expedience of its utilization can be more

important. We are living in a rapidly moving world of technical advances with changes occuring overnight, and a film approved for production today may be obsolete tomorrow. If some sacrifice in final film quality is inherent in kinescope recording, we feel it is justified by the fact that the information it contains is made available to the audience who need it, when they need it.

Earlier I made reference to the fact that we had taken delivery on a video tape recorder. We feel, although at present, our final product must be film, tape can increase our capability and give us greater versatility in the production of film. Some of the plans we have for the tape are:

1. When large release orders, such as 4 or 500 are required, the tape can be transferred to 16mm film giving an unlimited number or 1st generation negatives for release printing.

2. Where small release orders, such as 5 or 10 are required, the tape can be transferred to 16mm direct-positive composite without going thru the normal printing steps.

3. The tape affords immediate playback of a production which as most of us know important. After a production, the requestor, as well as technical and production personnel can check the show as to technical accuracy eliminating costly recall to re-record.

4. Training is another important use of tape. Both technical and production personnel can see the results of their efforts immediately and improve their proficiency.

5. Up until the delivery of the tape recorder, we recorded directly on film. In event of damage, either caused by processing, mechanical, or electronic failure, the entire production would have to be repeated, but with tape backup, a transfer is all that would be required.

Another reason the Photo Center feels that tape is important, is to provide a tape-to-film transfer service to the entire Naval establishment. As Cdr Parady explained Wednesday, the Navy is presently engaged in a program called plats, the Pilots Landing Aid Television System. This system now being installed on all attack carriers, utilizes television and tape recording to observe and record all landings for pilot critique, proficiency and accident prevention.

The Photo Center's interest in this program is the transfer of this tape to film for both training and frame by frame analysis. In conjunction with this program, we are expecting delivery of an Eastman Viscomat 16mm rapid processor. This processor varies from normal rapid processors in that it utilizes a viscous developer and fixer which spreads the chemicals uniformly over the emulsion. Developing time is extremely short, $2\frac{1}{2}$ to 7 seconds at a speed of 36 feet per minute. By threading the film directly from the kine recorder thru a light trap to the processor, and then to a projector, the requestor will be able to continuously view his composite film product during the transfer process, only some 70 seconds delayed. The film is then rewound and the requestor leaves with his acceptance print.

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In addition to providing rapid service, the viscomat will provide us with
an excellent training as well as engineering tool. We have found that
although a picture might look acceptable on a picture or waveform monitor,
the results may be disappointing when viewed on film. To be able to judge
and compensate for film and processing variables just prior to full
production or even during production will be a most valuable and cost savings
procedure. We intend to have one kinescope recorder permanently attached to
the processor at all times for an immediate composite acceptance print,
record negative on the other, and use tape as previously mentioned.
Although tape-to-film transferring will be a new service to the Navy,
it won't be completely strange to us. Thru cooperation with the National
Naval Medical Center's tv project and our good friend, Fred Butcher, we have
performed several transfers. The Bethesda TV project transports their video
tape recorder to the Photo Center and we transfer their tapes to film.
We haven't experienced any serious difficulty with this transfer technique
and do not expect any when in full operation with our own recorder.
I would like to say that not all of our operation has been without problems,
probably the most complex and troublesome area is that of kinescope recording.
Both electronics and photography have enough problems by themselves, but
when you combine the two, your problems seem to increase by the square.
with the advent of video tape and its superior live quality, the state of
the art of kinescope recording must and undoubtedly will be materially
improved, since there will always be many applications for film. So we
at the Photo Center are confident that the industry will soon offer a
superior kinescope film recording system which will repeatably yield tape
like quality on film. I have a short film to show which will give you
an idea of our final film quality. The film is made up of clips form three
different productions. The first a BUMED request entitled "The Compound
Microscope", the second from a Marine Corps request entitled "Aptitude-Area
Classification Testing", and the last, a clip of an interview between the
Chief of Naval Operations, Adm. George Anderson, and Howard K. Smith.
This last clip was recorded as a direct positive and the print you will
see is from a dupe negative or two photographic generations away from the
original.

Thank you very much.

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